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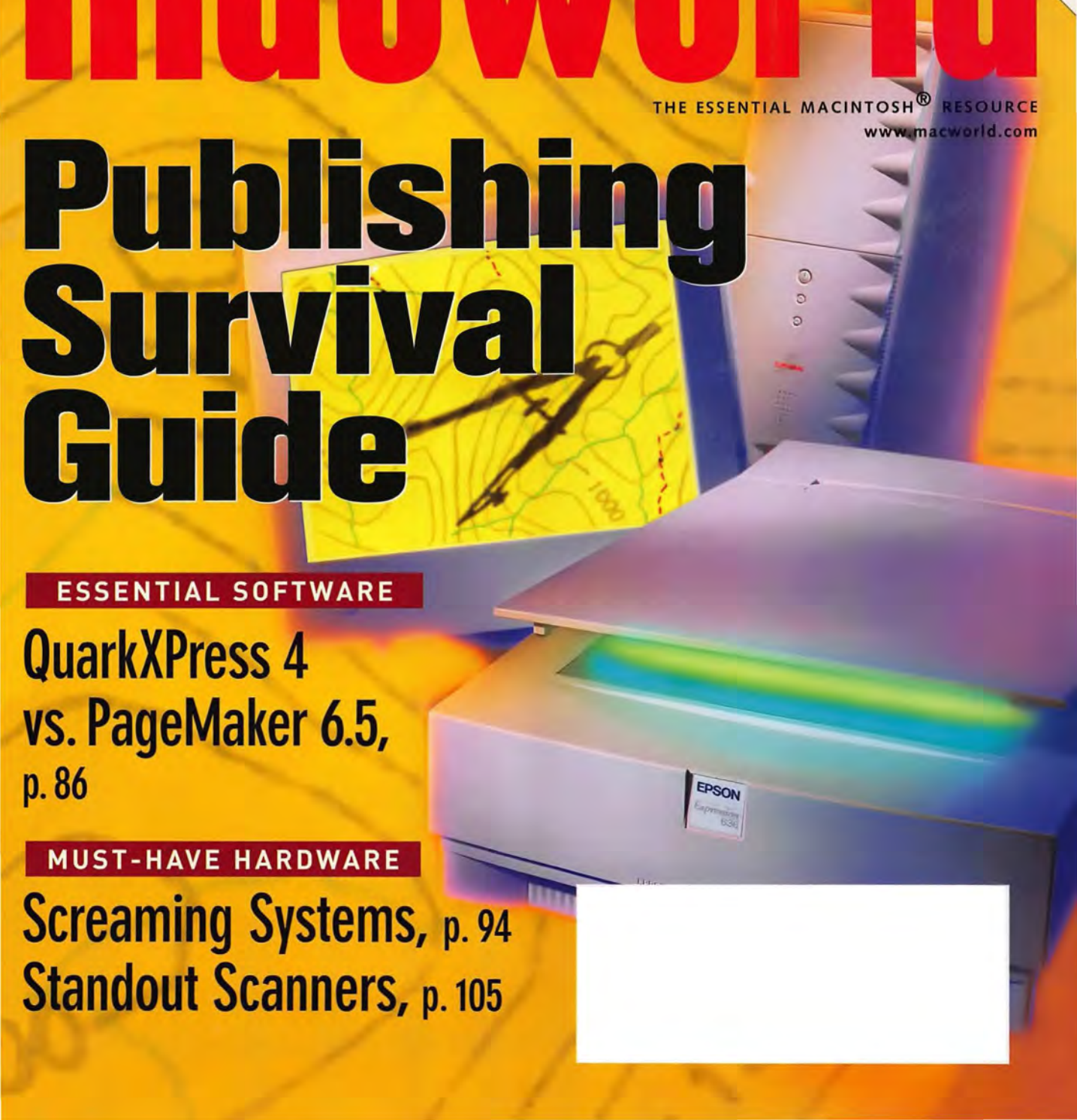
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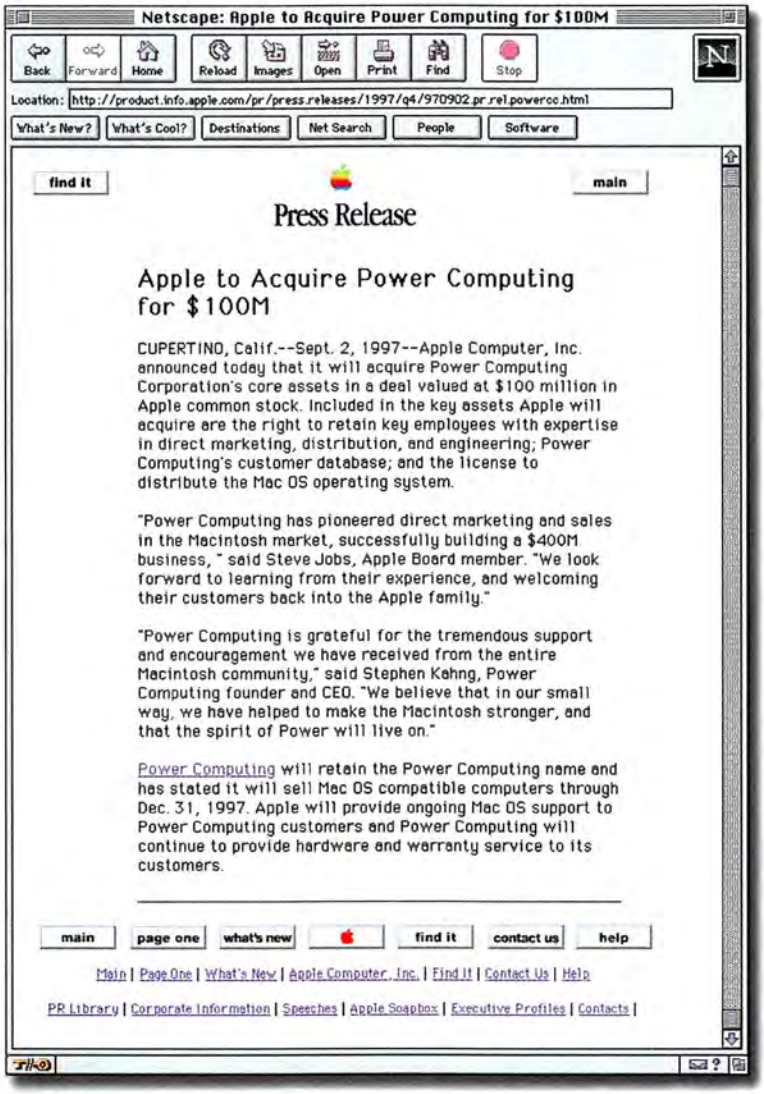
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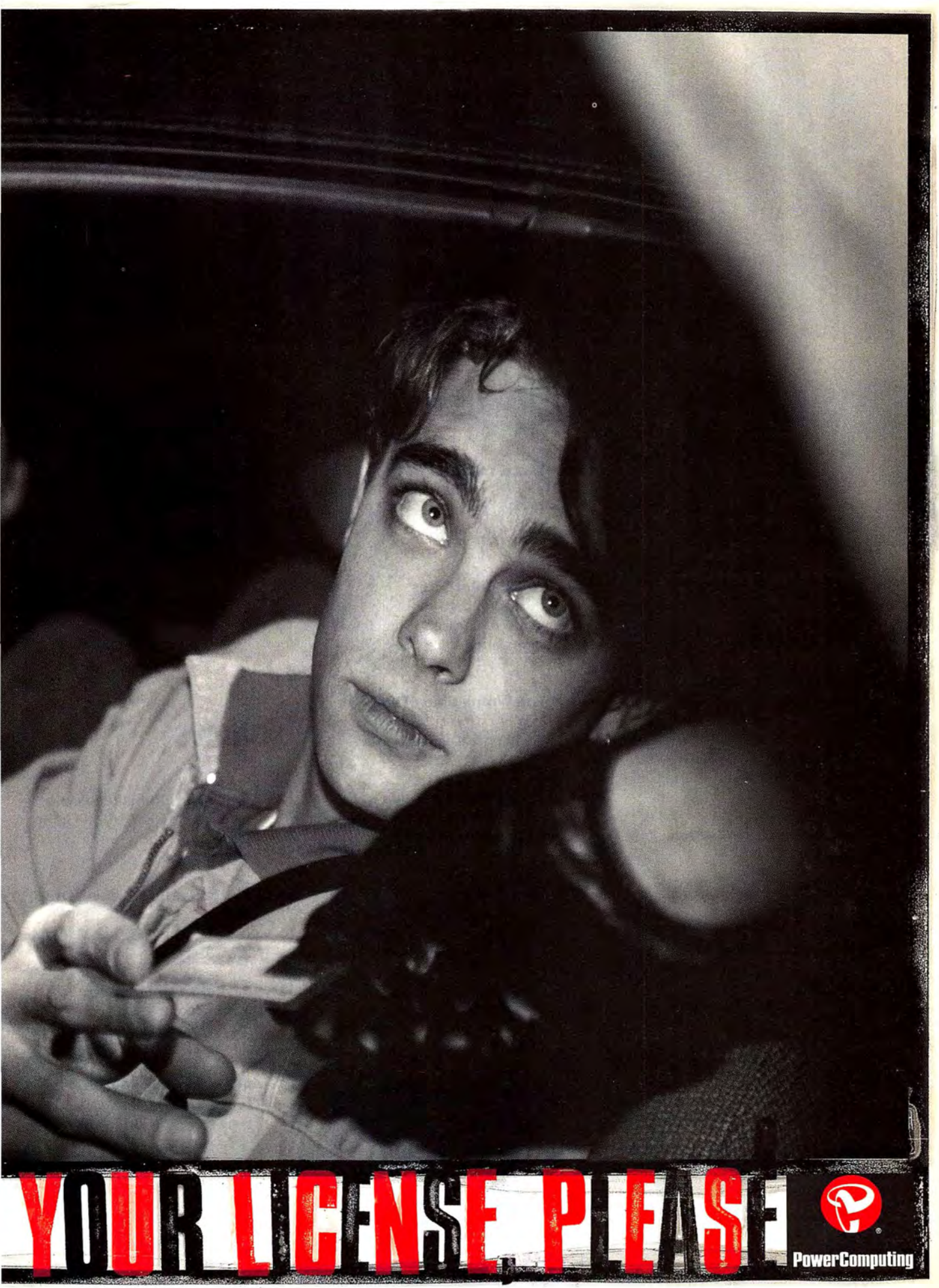
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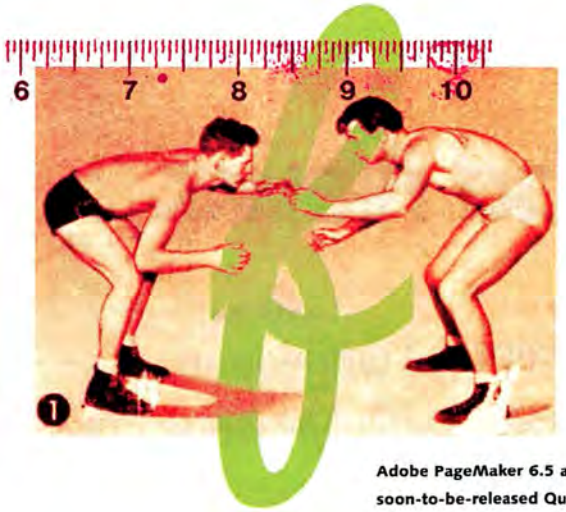
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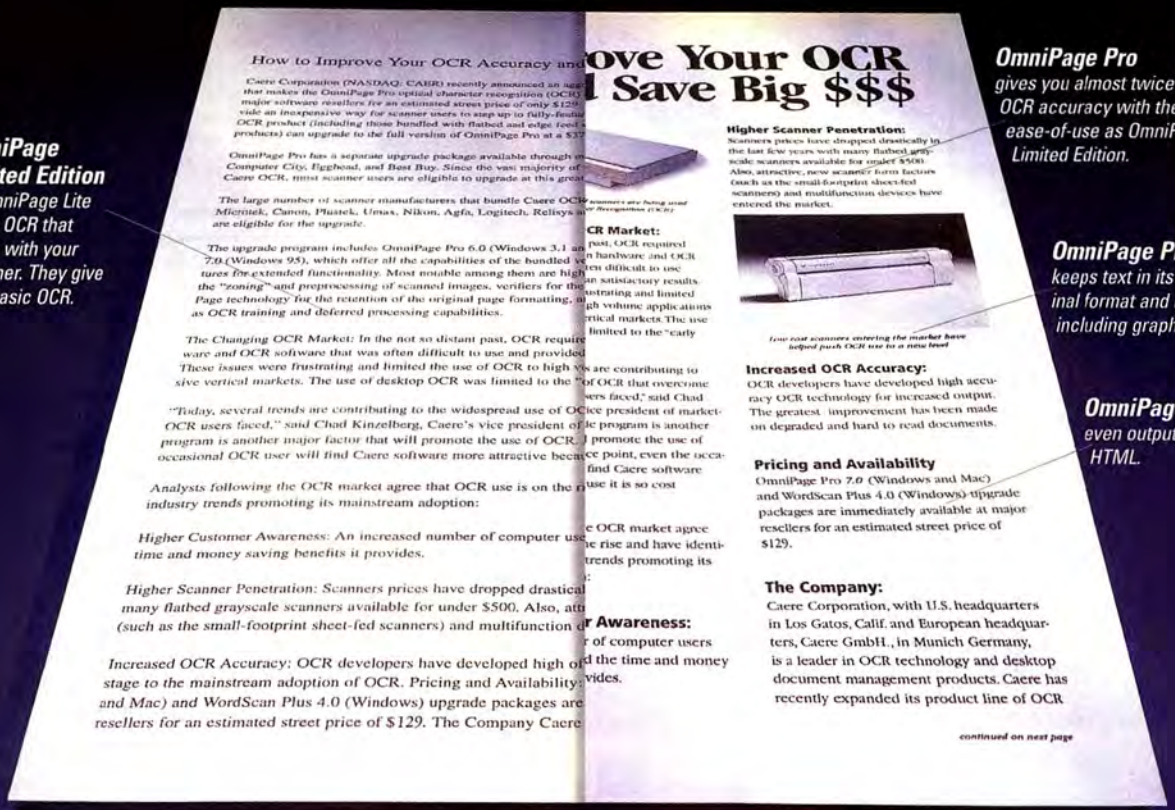
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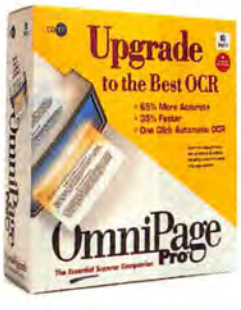
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Letters

Graceful OS Longevity

I WAS STRUCK BY FRANKLIN N. Tessler's observation that "even die-hard Mac supporters admit that the Macintosh Operating System is showing its age after almost 14 years" ("Mac OS 8 Arrives," September 1997). I wonder why the age of the Mac OS is something Mac users view with embarrassment rather than pride. After all, what other computer product has demonstrated such long-lived elegance?

My guess is that this is a defensive response to the barbs of Wintel pundits who have increasingly focused on the Mac OS's age when extolling the virtues of the more youthful Windows 95.

The last time I checked, Windows 95, like its predecessors, is still just a shell that sits atop MS-DOS. And how young and elegant is MS-DOS?

MARTIN H. TESLER
Alexandria, Virginia

Two-for-One Deal

I HAVE BEEN A LONGTIME SUBSCRIBER to both *Macworld* and *MacUser*. I've just heard that the two magazines have merged, and I have a question about subscriptions. I just renewed both magazines for three years each. Will you be extending my subscription for a further three years? Or will refunds be offered?

COLIN MANSFIELD
St. Paul, Minnesota

Subscribers to Macworld *will continue receiving the magazine, with* MacUser*'s content incorporated and with no interruption in service.*

Subscribers to MacUser *will receive* Macworld *in place of* MacUser *for the duration of their subscription.*



Subscribers to both Macworld *and* MacUser *will have one subscription to* Macworld*—one that will be extended by the number of copies remaining in their* MacUser *subscription. For more information on the merger, see* The Vision Thing *and "A New Era for Mac Pubs"* (News) *in the November 1997 issue.—Ed.*

Amelio-rating Apple

APPLE SHOULD BE VERY CAREFUL in choosing its next CEO. Whoever it chooses will make or break what could be the greatest computer company in the world. It was founded by young, energetic, visionary people in a fledgling industry. Now the vision has been lost, the philosophy is gone, and failure and bureaucracy reign. Apple needs to get the vision back and show the public that it is still an American icon worthy of respect.

If Steve Jobs is willing to take the CEO position again, let him have it. Maybe he can still remember what the whole thing is all about. Or maybe Apple should hire Phil Jackson. If he can run Apple the way he runs the Chicago Bulls, the Mac could be a champion once again.

SHANE LIESEGANG
Jacksonville, Florida

ONCE AGAIN APPLE HAS MANAGED to screw things up on the eve of great news (in this case, the release of Mac OS 8). I feel that Gil Amelio was the right person for the job, but Apple once again used the CEO for target practice. Apple gave Amelio an impossible job, and he did it; but now the company's losses are blamed on him. Just when things are starting to look up for Apple, it insists on dominating the headlines with bad press.

AHARON DE LA CRUZ
Queens, New York

SO LET ME GET THIS STRAIGHT. When it comes to personal computers, Apple has a superior product, but management just can't find anyone to run the company properly. Well, the solution is simple. Get a Macintosh to run Apple! I'm sure the 20th-Anniversary Mac would do a splendid job, turn the company around in no time, and have everybody smiling again! Just an idea.

JAMES MATHAN
San Mateo, California

We Do Tarot Cards Too . . .

I'M IMPRESSED—REALLY IMPRESSED. When Apple acquired Next and Steve Jobs returned, *Macworld* was in my mailbox within a week. There was the story, complete and accurate. Coincidence, I thought. Then Gil Amelio resigned on

continues

JEFF NEUMANN

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CORRECTIONS

- *Due to testing concerns, we will be revisiting our rating of the Fargo PrimeraPro Elite (*Reviews, *November 1997). A Second Look review will run in the January 1998 issue.*
- *Pre-Owned Electronics' phone number is 617/778-4600. The company does not have a Web address ("Upgrade Your Mac," August 1997).*
- *The list price of the Mitsubishi Diamond Pro 87TXM is $829 (*Reviews, MacUser, *October 1997).*
- *The list price for the Sophisticated Circuits PowerKey Pro Model 600 is $318 (*Quick Clicks, MacUser, *October 1997).*
- *On page 55 of the "Pop Art" feature (*MacUser, *September 1997), the captions for Phong-shaded and ray-traced images were reversed. The image on the left is Phong-shaded.*

July 9, and on July 15, my issue of *Macworld* was in my mailbox, complete with the story. Do you guys have a crystal ball?

R. KEWISH
Howard, Colorado

You Call This an Assistant?

I JUST READ YOUR REVIEW OF PERsonal digital assistants ("Top Pocket Organizers," September 1997), and I am disappointed in your assessment of the U.S. Robotics PalmPilot Personal. As a former owner of a Pilot 1000, I think the four-star rating was undeserved.

Pilot Desktop 1.0 for Mac does not support many features of the newer Pilot models, and it seems that U.S. Robotics has no plans to release a Mac version of Desktop 2.0. That means e-mail, expenses, and other features of existing Pilot applications cannot be backed up or synchronized with a Mac.

Another problem is the Mac version of Now Synchronize for Pilot. This program backs up only data relevant to Now Contact and Up-to-Date, leaving other Pilot features unsynched.

So yesterday I sold my Pilot 1000, and I am taking that money and doing with it what I should have done in the first place: buying a Newton!

J. CAPRIOLI
Worcester, Massachusetts

Actually, you can *do e-mail on the PalmPilot, and Now Synchronize* does *back up all of the Pilot's modules. Just use Pilot Desktop for the Mac to edit the Memo Pad, for example, and Now Synchronize will update your Pilot automatically. In other words, there's only one feature of newer Pilots that doesn't work on the Mac: the Expense Report module. Newtons are wonderful, but they're also three times the price of a Pilot, twice the size and weight, and 16 times greedier for batteries.—Ed.*

Stretching Mac OS 8

THE UTILITIES *MACWORLD* HAS CHOsen as essential add-ons to Mac OS 8 are great picks ("Best Utilities," September 1997). I have one question, though. Did the author really test these with OS 8? I'm running OS 8 on my Mac, and I've noticed that many of my favorite utilities are no longer compatible!

DAVID H. SCHWAB
Orange, New Jersey

We tested them with Mac OS 7.6 in order to have the article ready at the same time as Mac OS 8. We should have included a warning that with any new operating system, there probably will need to be updates and fixes before everything works together. Check the vendors' Web sites for OS 8 updates.—Ed.

What the Buzz Is About

ARE THE BEES ON THE COVER OF the September issue of *Macworld* [that subscribers received] an editorial comment on where you think the new OS should have gone? I don't see any Next machines on the cover.

BOB MUNGER
Lee, New Hampshire

The bees were the brainchild of former Editor in Chief Adrian Mello. No one knows why he wanted them on the cover, but someone said they overheard him muttering something about El Topo*—an obscure film from the 1970s.—Ed.*

CD-Player Secrets

I JUST READ "WHISTLE WHILE YOU Work" (*Secrets*, September 1997), and I would like to know whether it is possible to import the audio-CD title, artist,

continues

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track-name, and play-list information from the CD Remote Programs file into a spreadsheet or database program. If so, one could create a CD inventory.

BARRY L. RIDDLE
Chesterfield, Virginia

Great idea, but the information isn't packaged quite so neatly. If you open the CD Remote Programs file with ResEdit, you can access the data, but each CD's information is stored in its own resource and must be opened separately.—Ed.

Virtual Drag and Drop

IN YOUR SEPTEMBER ISSUE (*REVIEWS*) you say that Virtual PC doesn't allow you to copy and paste from PC programs to Mac applications. Connectix says this can be done. Who's right?

STEVE ROSENBERG
via Macworld Online

Nothing in the Virtual PC documentation indicates that you can copy from PC to Mac. You can *copy and paste from Mac to PC, but when you select text in a PC program, Virtual PC's Copy command is dimmed out.—Ed.*

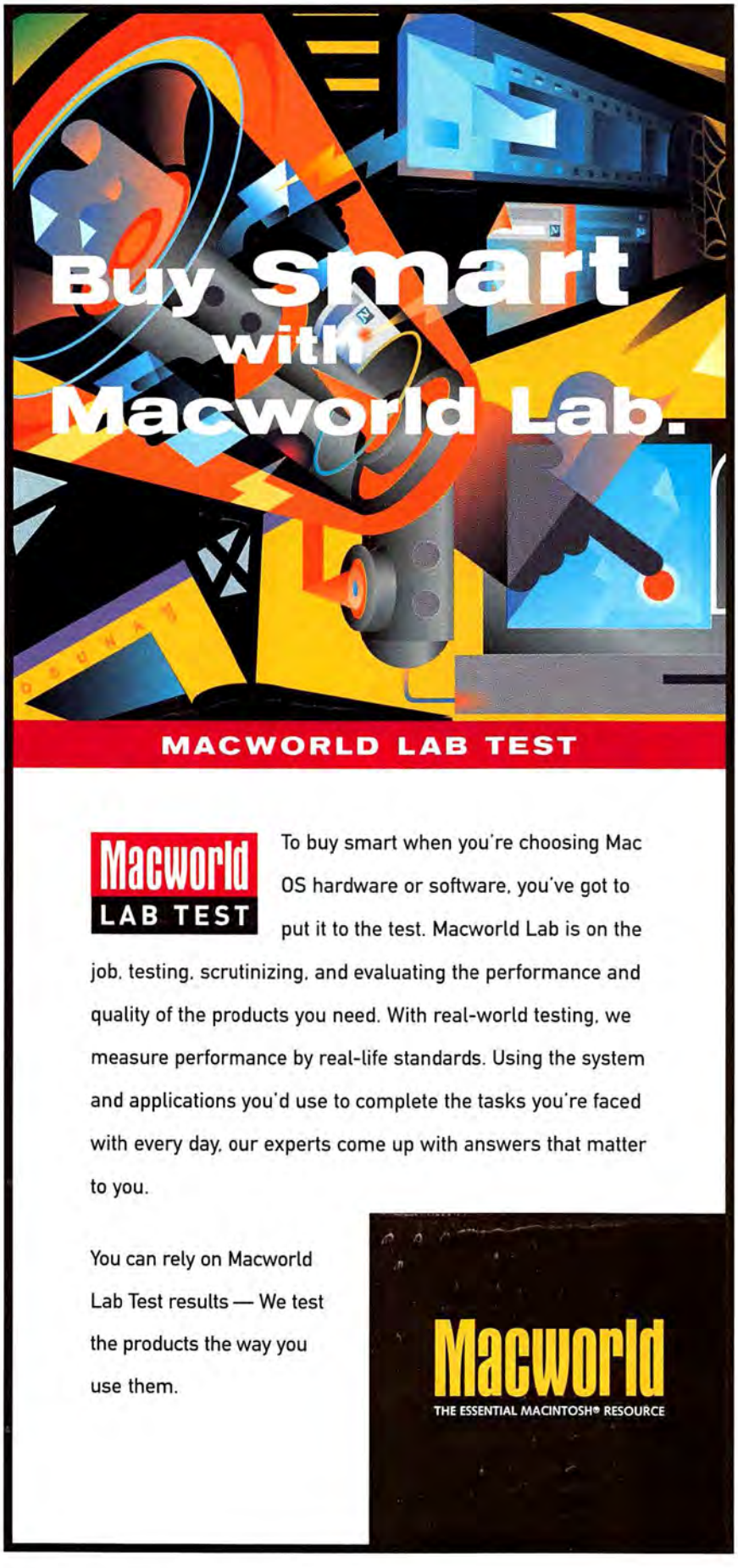
Horror-scopes

DAVID POGUE'S HOROSCOPE COLumn for Macintosh users was kind of frightening (*The Desktop Critic*, September 1997). I *did* in fact buy a PowerBook 5300 one week before they were discontinued, and I *am* an Aries. In general, it seems that I'm always destined to buy exactly the wrong model of computer at exactly the wrong time. I just bought an Apple 6500/275. One shudders to think. . . .

NATALIE BAAN
Far Hills, New Jersey

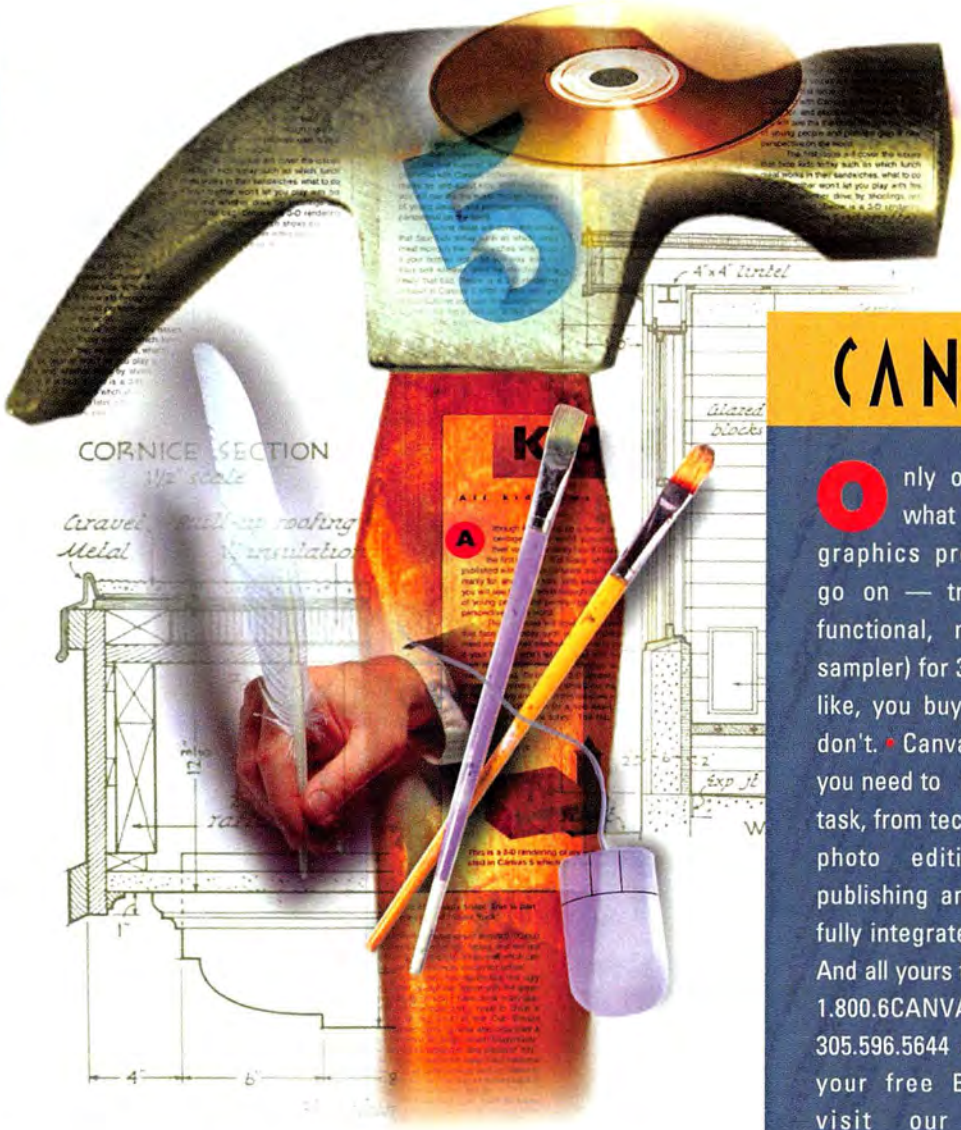
I knew *you'd write that.—David Pogue* m

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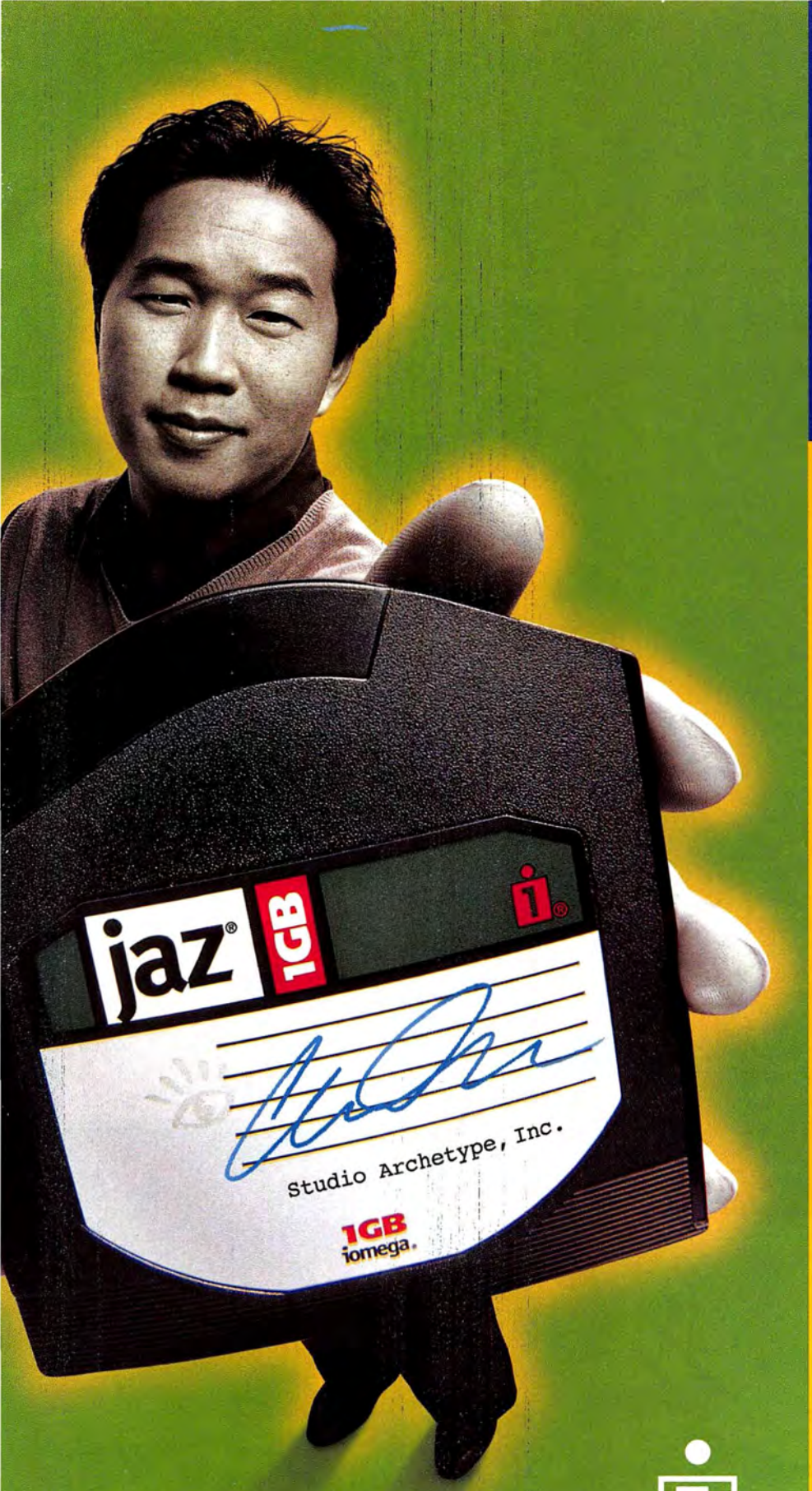
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Clement Mok is an idea guy. As creator of award-winning corporate identities and design solutions for companies like Microsoft, Twentieth Century Fox, Herman Miller, as well as Apple Computer, ideas are the capital of his three companies. Whether he's creating a cyber themepark, compiling tons of stock photos, or designing the elaborate kingdom of Valhalla for the local opera, his ideas need space. Big space. Which is what he gets with the high capacity Jaz® drive.

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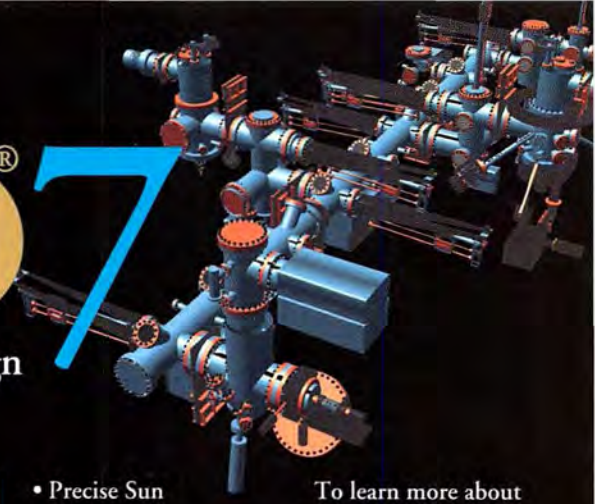
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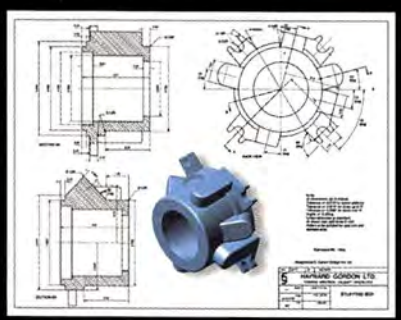
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The Vision Thing

by Andrew Gore

Necessary Roughness

IT TAKES A HARD MAN TO SUCCEED IN A TOUGH MARKET

NO ONE WAS SURprised when Steve Jobs declared himself CEO for now. It was inevitable, an acknowledgment of what everyone agreed was true. It's Steve's show, and it has been for some time. However, there's disagreement over whether it's a good thing that Steve's in charge. Some see Steve as the *only* person who can save Apple. After all, he created the company and imbued it with life and attitude. He's a visionary, one of the Greats of Silicon Valley, someone who can restore Apple to its former glory. Still others see Steve as Yesterday's News, like an aged hippie trying desperately to recapture the Summer of Love, too deluded to realize that his moment in the sun has passed.

Some have an even darker opinion: He's a runaway egomaniac incapable of building consensus, someone who pushes his agenda no matter what, a man who gives no quarter and asks for none. In short, a real pain in the neck.

Personally, I hope these folks are right. Let's face it: Apple has spent so many years making excuses for the Mac that I doubt most people at the company remember what it was like to actually be proud of their work. I'd like to see Apple act like it believes the platform really is as good as the company's half-hearted marketing efforts of the past have struggled to say it is. I use a Mac, and I like it better than Windows. I don't feel I should apologize for that, so why should Apple?

Play Hardball

No one ever accused Bill Gates of being a bleeding heart. About the only thing Bill has ever been tagged on, despite the best efforts of the Federal Trade Commission, is being enormously successful. I guess if he ever feels pangs of guilt over his company's business tactics, his roughly $40 billion in personal assets probably help him feel a lot better.

Larry Ellison, Oracle's head honcho and Steve's boardroom buddy, is also known to play for keeps. Some have speculated that his multiple public declarations of lust for Apple stock helped propel Jobs back into the driver's seat. Certainly Informix, Oracle's primary competitor, could quote you chapter and verse on exactly how hard a man Larry can be.

Fact is, you can't swing a venture capitalist by the heels down in Silicon Valley without hitting half a dozen execs known to employ rough tactics. It's about time Apple had a CEO who knows how to play



hardball. At least with Steve, Apple won't fail because it was afraid to use brass knuckles to get to the brass ring.

Think Apple

Of course, it's not enough for Steve to be tough. He's got to be right as well. Take, for example, the Think Different advertising campaign Apple recently launched. When I first heard the slogan, I thought, "Oh no, more unfocused, feel-good tripe paraded as a brand strategy." Then, I saw the commercial, and the sidewalk posters, and the billboards, and the huge ads covering entire city buses. And I heard Steve roll out the campaign at the Seybold conference in San Francisco with humanity and passion not heard from Apple's head office in a long, long time. I must admit, the cumulative effect was powerful. I could actually see a future for the Macintosh as the platform of choice for the counterculture; for the creative, inspired user in us all. It was the computer for the rest of us, all over again. And it was wonderful.

I also learned something interesting watching Steve roll out his campaign: The famed Apple Reality Distortion Field must be generated by Steve himself. All 2,000 keynote attendees were wrapped in it, and a parade of developer luminaries whose Mac support had recently come into question even gave tearful testimonials to Steve and his amazing technicolor dream machine. John Warnock, CEO of Adobe Systems, kneeled at Steve's altar, praising his return. Tim Gill, chief technology officer of Quark, had to pause several times during his presentation, seemingly too choked up to continue. And even Bud Colligan, chairman of Macromedia, stood up for Steve and declared his undying loyalty.

I don't know if it was Steve's incredible powers of persuasion that got these formerly irascible executives to so passionately recommit themselves to the Macintosh or if perhaps more-malevolent political arm-twisting was employed. What I do know is that in his first 12 weeks as CEO, Steve has produced results that a parade of predecessors couldn't manage in five years.

And all I can say is, Go, Steve! **m**

Got an opinion? Want to make something of it? E-mail your comments to visionthing@macworld.com.

JOHN RITTER


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- MacWeek 6/20/97
"Running PC software on a Mac isn't new. But Virtual PC...is the cheapest, easiest, and most complete answer I've seen."
- BusinessWeek 8/7/97
"Virtual PC is the easiest and most complete way to run Windows software on a Mac without spending a fortune."
- Wall Street Journal 7/17/97
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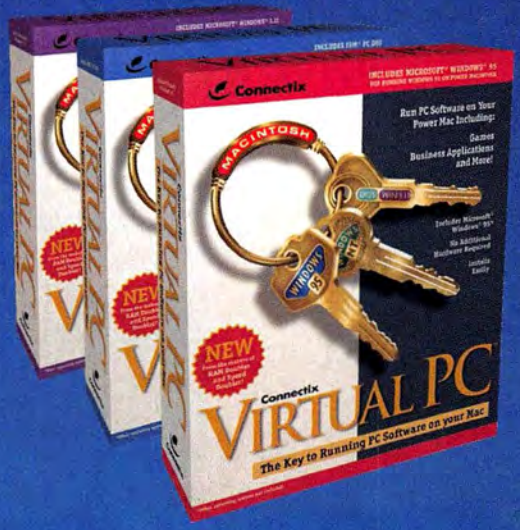
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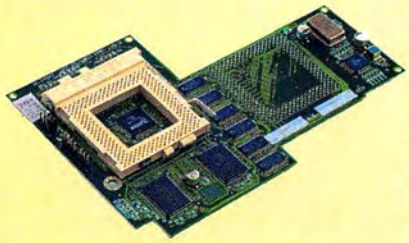
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News

SPECIAL REPORT

Jobs Pushes Apple into the Future

KEY SOFTWARE VENDORS EXPRESS SUPPORT FOR CEO'S INITIATIVES

by Stephen Beale



PHOTOGRAPHS: APPLE COMPUTER

Licensing is dead, Apple is still losing money, and Microsoft continues to move into markets once dominated by the Macintosh. Nevertheless, Apple interim CEO Steve Jobs appears to be making progress in his efforts to revive the ailing company.

Users won't see tangible results until January's Macworld Expo, when Apple is expected to announce a new network computer (NC) that runs the Mac OS. But Jobs has gone far toward reassuring important segments of the Mac community that better times lie ahead.

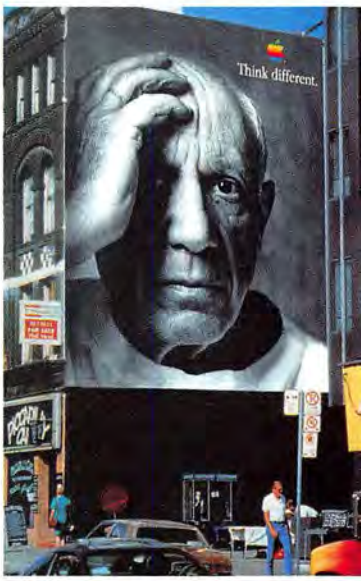
This became clear October 2, when Jobs made a keynote presentation as part of the Seybold San Francisco computer publishing show. Much of the speech was a rehash of Jobs's Macworld Expo keynote in August, along with a spirited defense of Apple's move to curtail its Mac OS licensing program.

But Jobs also revealed that three key Macintosh software developers—Adobe Systems, Quark, and Macromedia—are playing a role in the company's decision-making processes. Adobe CEO John Warnock, Quark founder Tim Gill, and Macromedia chairman Bud Colligan all stepped to the stage to express support for Apple's new direction under Jobs—something that never happened during Gil Amelio's tenure as CEO.

Jobs also presented the company's ambitious new advertising campaign, which is aimed at promoting Apple's brand identity as opposed to its hardware or software products. The Think Different advertisements, slated for television and print, feature images of Albert Einstein, Pablo Picasso, Martin Luther King, and other historical figures; the message is that Apple customers are the kind of people who will rock the boat to effect positive change in the world. The campaign was created by TBWA/Chiat Day, the ad agency—recently rehired by Jobs—that produced the famous "1984" commercial that launched the Macintosh.

Speaking to the Seybold

continues on page 40



Motorola, IBM Drop Mac Clones

THE LICENSING EXPERIMENT IS OFFICIALLY OVER

by Galen Gruman

Just a few weeks after buying Power Computing's Macintosh business, on September 2, Apple Computer completed its near elimination of Mac clones as Motorola Computer Group, IBM Microelectronics, and Tatung announced that they were pulling out of the Mac-systems market. Only Umax Computer remains a Mac OS licensee, but Umax cannot introduce any new Mac technologies and its current deal is set to expire in July 1998.

Motorola Bows Out Motorola announced on September 11 that it was leaving the Mac market because it could not reach an agreement with Apple on retaining a viable Mac-systems business. (See "Apple Eliminates the Top Clone Vendor" and "Why Apple Pulled the Plug," *News*, November 1997.)

"You can sue for divorce but you can't sue for marriage," says Joe Guglielmi, corporate vice president and general manager of Motorola Computer Group, explaining why the company decided not to try to force Apple to stick with its original licensing plan. "Obviously, we're disappointed, but Apple has made its decision and we're going to move on."

Because of the pullout, Motorola will not ship the StarMax 6000 systems, the faster-than-anything Macs announced at the August Macworld Expo that were based on the Common Hardware Reference Platform (CHRP) design codeveloped by Apple, IBM, and Motorola. Apple has refused to certify CHRP systems three years after it trumpeted CHRP as the future basis for Macintosh systems.

Motorola will sell its StarMax 3000, 4000, and 5000 systems until they run out. The company will honor its five-year warranties and will increase the free phone-support period from 90 days to 12 months, so its current customers are not stranded. While inventory lasts, it will continue to supply these systems to its sublicensees, such as APS Technologies, PowerTools, and Vertegri Research, which resell them under their own names.

Motorola will ship Mac OS 8 with StarMax 5000's sold in the United States. Apple did not sign an agreement to allow Motorola to preinstall Mac OS 8, but resellers of the StarMax 5000 series will include a Mac OS 8 coupon in the box. StarMax 5000 systems sold outside the United States, as well as the remaining stock of StarMax 3000 and 4000 systems (which had been discontinued in late spring), will be sold with Mac OS 7.6.

"We entered into [the Mac market] at Apple's invitation," Guglielmi says. "We did that because we believed we could expand the market."

Apple has accused the licensees of cannibalizing its sales, but Guglielmi believes that Motorola was on the verge of helping the market grow. "Now we'll never know," he says.

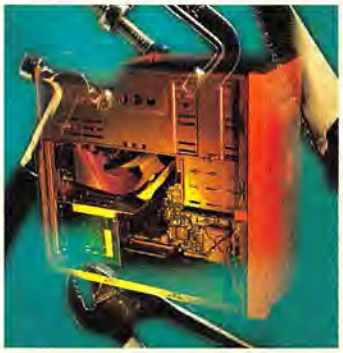
Motorola, which had about 5 percent of new Mac sales in the second quarter of 1997, says it received no compensation from Apple for pulling out and expects the pullout will reduce earnings by an undisclosed sum. Motorola Computer Group will continue to produce its VMEbus-based computer systems and will look to use

continues

Support for Clone Users

Now that Power Computing, Motorola, and other Mac OS licensees have pulled out of the market, many users are wondering where they'll go for warranties and technical support. The good news is that few if any users will be left in the cold.

POWER COMPUTING Power Computing, which has sold its Mac business to Apple, will provide all tech support for hardware and software until December 31. Beginning January 1, 1998, Power Computing customers should call Apple tech support, which will determine if the problem is caused by the hardware or system software. Apple technicians will handle software problems and refer hardware troubles to Power Computing.



MOTOROLA Motorola sold its StarMax systems with five-year warranties, which the company says it will honor. Motorola has also extended its free phone-support period from 90 days to 12 months.

APS TECHNOLOGIES APS, a Motorola sublicensee, sold its Mac systems with a two-year warranty, which it will honor. However, systems sold from now on will likely be limited to a one-year warranty. APS expects to have supplies of its MPower Mac systems until the first quarter of 1998. APS currently offers toll-free telephone support for its Mac systems and mass-storage products, but says this service will probably end in the near future. In its place, APS will let you choose from two options: a toll number you can call for free support, or a toll-free number you can call under a variety of paid support plans.

MAC OS UP-TO-DATE Apple announced September 15 that it would extend its Mac OS Up-To-Date program to Power Computing and Umax Computer.

In August, Apple had said it would not allow Mac clone customers to participate in the program, which lets you purchase Mac OS 8 for $9.95 if you bought a system with Mac OS 7.6 on or after June 22, 1997.

To be eligible, you had to submit your upgrade order by October 15. However, if you previously ordered Mac OS 8 under the program, Apple says you will receive the upgrade automatically. If you bought a Mac between December 7, 1996, and June 21, 1997, you are eligible for a $9.95 upgrade from System 7.5.X to Mac OS 7.6.—STEPHEN BEALE

GIBSON

its technologies in other products. The company expects layoffs to be minimal.

IBM Departs A few days after Motorola's announcement, IBM officials confirmed that IBM Microelectronics would eliminate its Mac OS–licensing business for reasons similar to Motorola's. Apple's about-face on licensing ends IBM's hopes of developing a motherboard-manufacturing business for Macs similar to Intel's motherboard business for PCs.

IBM notified its two sublicensees—Taiwan's Tatung and Japan's Akia—that it will not continue as a Mac OS licenser. Both companies had designed Macs using IBM's Long Trail CHRP design, which Apple now refuses to certify. IBM is also ending licensing discussions with about ten companies in Asia and Europe that were seeking to ship CHRP-based Macs and get Mac OS licenses through IBM.

Tatung, a major Taiwanese electronics manufacturer that supplies some system components to Apple, developed its TPC-6600, which is based on the Long Trail design, nearly two years ago. The company also added the first 75MHz system bus to be found on a desktop computer (see "Tatung CHRP Mac Keeps Pace," *News*, November 1997); that system has been ready for manufacture since spring, awaiting only certification and a Mac OS 8 agreement from Apple.

Although Tatung's Asian focus matched one of Apple's stated market targets for licensees, Tatung says Apple's refusal to let other companies use CHRP technology gave it no choice but to withdraw. "We are really disappointed at Apple's decision, because our customers have been eager to buy the machine," says J. L. Tsay, general manager of Tatung Systems.

Tsay hopes that Apple, which will use CHRP technology in its own forthcoming systems, might take advantage of Tatung's CHRP expertise in engineering and manufacturing.

Umax Remains With Apple's buyout of Power Computing and the pullout of Motorola and IBM, Umax Computer remains the only Mac OS licensee. Apple earlier reached an agreement with Umax that lets it include Mac OS 8 on its existing SuperMac line. Apple will also certify some Umax systems based on previously licensed Apple motherboard designs, including the Tanzania design used by Motorola in its StarMax 3000 and 4000 series and by Apple in its Power Mac 4400. However, Apple will not certify new technologies, such as CHRP or the PowerPC 750, for Umax systems. The Apple-Umax agreement expires in July 1998 and is essentially a ratification of earlier agreements rather than a new licensing deal.

PowerPC Prospects Motorola Semiconductor Sector, a separate division from Motorola Computer Group, will continue to sell PowerPCs to Apple. However, the *San Jose Mercury News* has reported that Motorola will pull out of PowerPC manufacturing for desktop systems and that IBM Microelectronics, which originated the PowerPC, will stop trying to compete with Intel in the desktop-systems CPU business. This could mean that IBM will stop investing in development of new, faster PowerPCs, such as the PowerPC 750, which Apple refused to let the licensees use.

IBM denies that it is reducing its investment in PowerPC—Apple remains by far its largest PowerPC customer, it says—but acknowledges that it is investing in other markets for the PowerPC technology. IBM says it will continue to work with Apple on understanding the latter's CPU needs.



IBM and Motorola have agreed to extend their PowerPC-design partnership to include PowerPC CPUs for embedded systems, such as cards; their joint Somerset facility, in Austin, Texas, had been focusing exclusively on CPUs for desktop computers. Each company designs its own unique PowerPC CPUs in addition to collaborating on the PowerPC 60X and 750 series at Somerset.

Additional reporting by HENRY BORTMAN.

graphics

Adobe Kills Persuasion

PRESENTATION PROGRAM FALLS VICTIM TO POWERPOINT, OLD AGE

by Stephen Beale

Chalk up another victory for Microsoft: Adobe Systems (408/536-6000, www.adobe.com) announced that it has discontinued Persuasion 4.0, its once-market-leading presentation program, as of September 1.

Adobe says it will provide technical support for registered Persuasion users but will no longer sell the package. "We believe other product areas offer higher potential return for the resource investment required," the company says in a statement on its Web site.

Persuasion 4.0, the last major release of the program, shipped in November 1996 to less-than-enthusiastic reception. Some users were confused by the new interface, which had been revised to resemble the look and feel of Adobe's other graphics packages. The only other significant new feature was the ability to convert presentations into PDF documents that could be posted on the Web.

Roseanne Brown, owner of RB Images, a slide-presentation service bureau in Los Angeles, says the upgrade to Persuasion 4.0 drove many users to other programs, such as Microsoft PowerPoint and QuarkXPress. In addition to the new interface, she says, the Persuasion upgrade caused a variety of output problems.

One factor favoring PowerPoint, Brown says, is its inclusion in Microsoft Office. This reflects the nature of business presentations, which are often produced by marketing executives rather than by the graphic designers who represent the market for most of Adobe's other products.

Persuasion also fell victim to its maturity. Early releases gave you almost every feature needed to create slides; after that, upgrades were largely limited to adding multimedia functions as slides gave way to LCD projectors and other presentation media.

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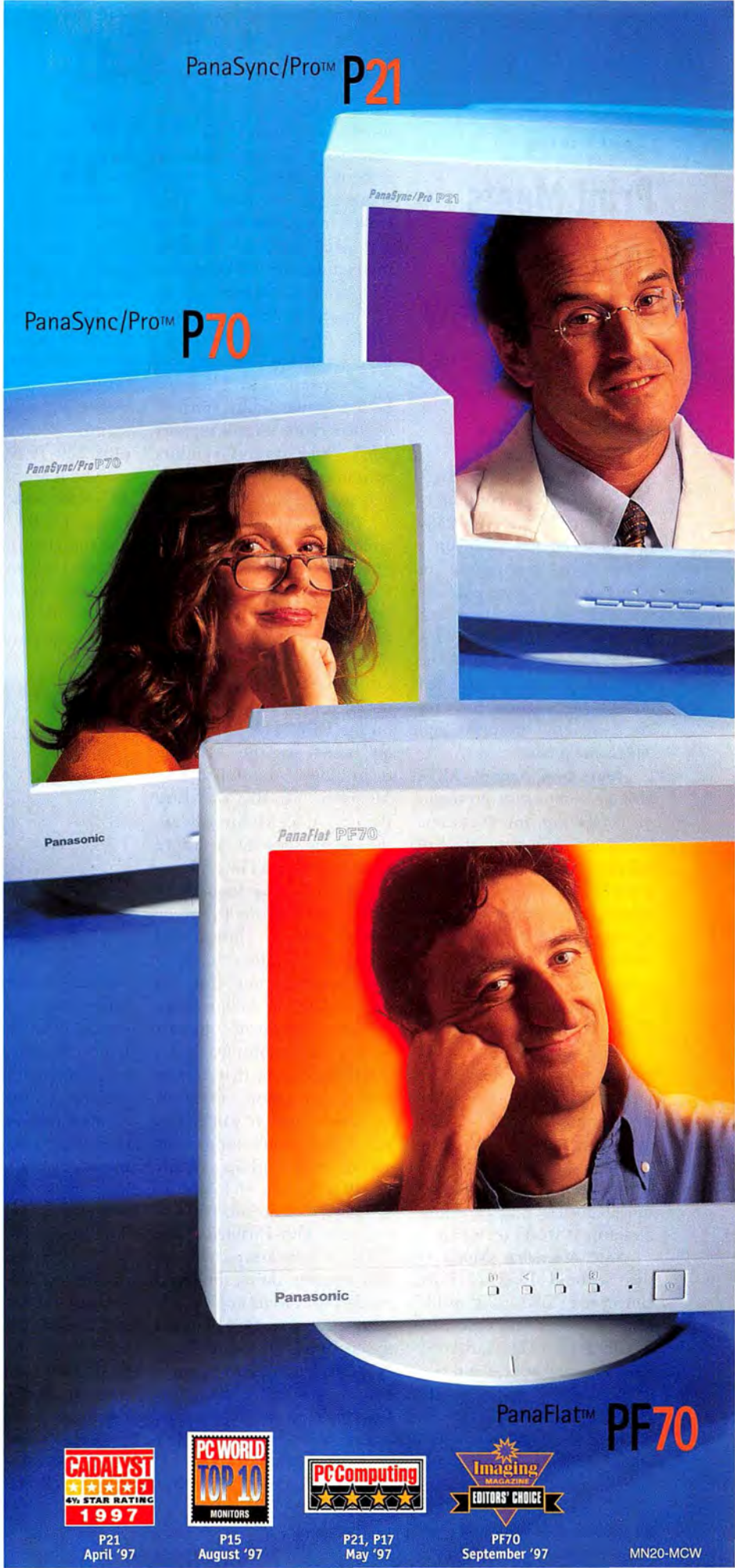
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publishing

Print Meets the Web at Seybold Show

XML, DIGITAL PRINTING AMONG HOT TOPICS

by Stephen Beale

Seybold San Francisco, the big computer-publishing trade show, has taken on a split personality in recent years, as print publishers look for new opportunities on the Internet. This year's edition continued the trend, as exhibitors unveiled dozens of products for creators working in print and electronic media.

Your Own Yahoo! Mike Homer, senior vice president of marketing for Netscape Communications, got the ball rolling at the opening keynote, in which he previewed Aurora, a forthcoming module for Netscape Communicator that provides a common, seamless interface for organizing content on the Web and the desktop.

The software, Netscape's answer to Microsoft's Active Desktop for Windows, functions much like Yahoo! or other Internet search engines, letting you organize files into a taxonomy of categories and subcategories. Unlike Active Desktop, it works on a Mac.

XML Ascending Much of the Seybold Internet buzz concerned XML (eXtensible Markup Language), a new standard for Web authoring that is more complex and also more powerful than HTML. HTML tags are limited to defining the look of a document; XML tags can define how the information in a document is structured. For example, a tag might identify a certain piece of text as someone's first name. This makes it possible for you to sort data locally rather than interacting with a Web server. The same XML link can be set up to jump to different URLs depending on conditions set by the Web author.

Microsoft and Netscape both said that future versions of their browsers will support XML, and several vendors announced authoring products that support XML.

DIG It Nine vendors, including Adobe, Canon, Eastman Kodak, Hewlett-Packard, IBM, Intel, Live Picture, and Microsoft, have formed a nonprofit consortium called Digital Imaging Group that will define a new image format largely for use on the Web. The format will be based on the FlashPix technology developed by Microsoft, Kodak, and Live Picture. Apple says it may use the technology in a future version of QuickTime VR.

More for the Web Auto F/X (603/569-8800, www.autofx.com) introduced WebVise Totality, a $129 Web-graphics suite that has GIF and JPEG compression, a GIF animator, digital-watermarking software, and a dithering engine that creates new colors from the 216 Web-safe hues. It works as a stand-alone application or as an Adobe Photoshop plug-in.

Bitstream (617/497-6222, www.bitstream.com) announced Java-Enabled Type (JET), a software technology that permits the scaling and rendering of fonts in Java programs. It currently is limited to supporting Bitstream's TrueDoc font format, but the company says it will add support for TrueType and Type 1. Bitstream will offer JET to other software developers.

NetObjects (415/482-3200, www.netobjects.com) announced TeamFusion, a client/server system for collaborative Web-site development. It uses a Windows NT server, but you can add or update pages with any Java-capable browser.

Large Developments On the print side, a host of vendors, including ColorSpan (formerly LaserMaster; 612/944-9330, www.colorspan.com), Xerox Colorgrafx (408/229-3929, www.xerox.com), Hewlett-Packard (619/487-4100, www.hp.com), CalComp (714/821-2000, www.calcomp.com), and Raster Graphics (408/232-4000, www.rgi.com), introduced large-format ink-jet printers. The latest generation of ink-jets



offers faster output and better image quality, at prices ranging from $20,000 to $50,000. Expect to see them in your local service bureau within the next year or so.

Fast Lasers QMS (334/633-4300, www.qms.com) introduced a pair of color laser network printers, the Magicolor 2 CX and 2 EX. The Magicolor 2 CX, priced at $3,500, features 600-dpi resolution, 24MB of RAM, a built-in Ethernet connection, and an output speed of 4 to 8 color pages per minute. The $5,000 Magicolor 2 EX features 80MB of RAM, boosting resolution to 1,200 dpi.

Epson Scans Epson (310/782-0770, www.epson.com) introduced a pair of new flatbed scanners: one for consumers and small businesses and the other for graphic-arts professionals. The $300 Perfection 600 features 600-by-1,200-dpi optical resolution, a 30-bit color depth, and a legal-size scanning bed. An optional transparency adapter costs $200. The $2,500 Expression 836XL offers 800-by-600-dpi optical resolution, a 36-bit color depth, and a tabloid-size scanning bed. A transparency adapter adds $500 to the price.

NT Encroachment Windows NT continued its move into the prepress market, as numerous exhibitors demonstrated servers and raster-image processors (RIPs) running on Microsoft's high-end operating system. However, these products are not necessarily threats to the Macintosh. Rampage (617/891-9400, www.rampageinc.com), for example, showed a new NT-based RIP that's controlled by client software on a Macintosh. Microsoft chairman Bill Gates, speaking during a special keynote session, said that Windows NT 5.0, slated for introduction next year, will offer enhanced support for Mac clients. However, it is also clear that Microsoft is eyeing the workstation market; as part of the Gates keynote, an Adobe representative demonstrated Photoshop 4.0 running under Windows NT.

Quark (303/894-8888, www.quark.com) announced that it will offer a native version of QuarkXPress 4.0 for Digital Equipment Alpha workstations running Windows NT.

Quark also said that it will offer import and export filters for Adobe's PDF format shortly after it ships the Mac version of QuarkXPress 4.0.

PETER HOEY

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Circle 59 on reader service card

productivity

Microsoft Previews Mac Office 98

WILL FEATURE SELF-REPAIRING APPLICATIONS

by Marty Cortinas, MacWeek

Microsoft (206/882-8080, www.microsoft.com) has sketched out the path for the upcoming release of Microsoft Office 98 for the Macintosh. The productivity suite, which the company hopes to ship at the end of the year, will include Word 98, Excel 98, PowerPoint 98, Outlook Express, and Internet Explorer.

The file formats in Mac Office 98 will be identical to those for Office 97 for Windows, the company says. Microsoft had originally planned to deliver Office 97 for Mac but fell behind schedule on porting that product from Windows.

Promise Fulfilled? As promised when the latest Apple-Microsoft alliance was announced at Macworld Expo in August, new technology for the Office suite will debut on the Mac with this release, the company says.

Microsoft plans to introduce simpler installation and self-repairing applications in Mac Office 98. You will be able to install Office 98 by dragging a folder from the CD-ROM to your hard disk. Any necessary shared libraries will be installed when each component is started for the first time.

Office will be self-repairing: if shared libraries are moved or deleted, Office will detect the changes and make the appropriate adjustments.

The new version will also offer full QuickTime and QuickTime VR support.

More Like a Mac The company says it will make Office 98 more Mac-like in appearance and behavior. For example, it will support Macintosh drag and drop and follow the Apple Platinum Appearance specification.

Office 98 will run only on PowerPC-based Macs and will require System 7.5 or later. Pricing and upgrade information was not available at press time.

In other Office news, the company has posted the beta version of the Microsoft Word 97-98 Import Converter for Macintosh. The translator changes Windows Word 97 files to Mac Word 5.1 or 6.X format. You can download the beta from www.microsoft.com/macoffice/prodinfo/office /coexist.htm/.

graphics

Kodak and Olympus Go Eye to Eye

AGFA ALSO UNVEILS NEW DIGITAL CAMERA

by Stephen Beale

Two of the most successful vendors in the digital-camera market have borrowed a page from each other's playbooks with their latest products: a pair of 3× zoom cameras from Olympus America (516/844-5000, www.olympus.com) and a new model from Eastman Kodak (716/724-7007, www.kodak.com) that packs a 1,152-by-864-pixel sensor and other features in a compact body. Meanwhile, Agfa (201/440-2500, www.agfa.com) has introduced its own digital camera with zoom capabilities.

Slimmed Down Kodak's DC210, which was scheduled to ship in October, is a 2× zoom camera that joins the popular DC50 and DC120 in Kodak's product line. The latter two cameras offer 3× zoom capability, but their bulky "binocular designs," as Kodak describes them, make them unwieldy. The DC210, in addition to offering relatively high resolution, resembles a conventional point-and-shoot camera—much like recent models from Olympus. It features an optical viewfinder, a 1.8-inch color LCD, automatic flash, video-out, and infrared compatibility.



The Olympus D-500L features 1,024-by-768-pixel resolution and 3× zoom.

Images are stored in FlashPix or JPEG format on CompactFlash memory cards; a 4MB card is included in the package. Bundled software includes Adobe PhotoDeluxe and Adobe PageMill. Windows users also get Kodak's new Picture Easy 2.0 software, which offers basic image-access and -editing functions; Kodak says it is working on a Mac version. That's not the only indignity for Mac users; you'll need to buy a $25 Mac connection kit to use the $899 camera.

Olympus Zooms The D-500L and D-600L from Olympus are the company's first digital cameras to offer optical zoom capability. While somewhat bulkier than Olympus's D-220L and D-320L, they are easier to hold than the DC50 or DC120. The $899 D-500L features a 1,024-by-768-pixel imager; the $1,299 D-600L's resolution is 1,280 by 1,024 pixels. Each features an optical viewfinder and a 1.8-inch color LCD.

They store images on Solid State Floppy Disk Cards (SSFDCs); the D-500L includes a 2MB card—enough to store 3 to 25 images, depending on resolution; the D-600L includes a 4MB card, which can store 4 to 50 images. Olympus offers an optional PC Card adapter for the SSFDC media and says it will soon offer a 3.5-inch floppy-disk adapter.

Bundled software includes PhotoDeluxe and InMedia Slides & Sounds presentation software. The cameras were scheduled to ship this October. Olympus also offers a $240 accessory kit that includes a leather camera case, rechargeable AA batteries and charger, an AC adapter, 4MB SSFDC media, and Olympus PictraAlbum image-cataloguing software.

Agfa Zooms Agfa has introduced the $899 ePhoto 1280, a 3× zoom camera with a lens that can swivel 270 degrees. It captures images at resolutions of 1,024 by 768 or 640 by 480 pixels, with or without JPEG compression. Images can also be interpolated to 1,280 by 1,024 pixels.

The camera stores images on SSFDC media; an included 4MB card holds 6 to 60 images, depending on resolution. Other features include a 2-inch LCD, video-out, rechargeable AA batteries, and a charger.

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Internet WATCH

BY MACWEEK STAFF

Apple Automates Internet Addressing

Forget about cutting and pasting that long Web or e-mail address. Apple's newly released Internet Address Detectors (IAD) plug into Mac OS 8 and automatically recognize Internet URLs. IAD takes advantage of the contextual-menu technology that Apple introduced with Mac OS 8. With an Internet URL highlighted, holding down the control key pops up a menu filled with actions appropriate to that item. Users can automatically go to Web pages, download files via FTP, create e-mail messages, and (using Claris Emailer) add an e-mail address to an address book. Software vendors must rewrite their applications to support contextual menus. Currently, users can try out IAD with Emailer, Bare Bones Software's BBEdit, and the Mac OS 8 SimpleText application. IAD is available at www.macos.apple.com/macos8/iad/.



Symantec Reworks Java Tools

Symantec (541/334-6054, www.symantec.com) says it will retool its products for Java development and release the new generation this fall. The company previously offered Café, a nonvisual Java programming tool; Visual Café, a graphical development environment; and Visual Café Pro, a tool for tying databases and Java. The Mac version of Visual Café Pro never shipped. Now, Symantec says, it will sell two Mac products: the $299 Visual Café for Java Professional Development Edition, which will include support for version 1.1 of Sun Microsystems' Java Development Kit; and the $499 Visual Café for Java Database Development Edition, which will include database connectivity.



WebStar to Support WebObjects

WebObjects applications can't be developed or deployed under the Mac OS, but it will soon be possible to integrate them with WebStar, the leading Mac OS Web server. StarNine (510/649-4949, www.starnine.com) has announced software that lets Webmasters link the Web-server package with applications created with the Next/Apple tool kit. WebObjects applications can be run on any of the platforms the package supports, including OpenStep, NextStep, Windows NT, Solaris, and soon Rhapsody. A development version of the adapter is available at ftp://ftp.starnine.com/pub/betas/webobjects_adapter.sea.hqx. The final version will be released later this fall and will be in the next release of WebStar.



PETER HOEY

systems

Apple Readies Revision to Mac OS

BRIDE OF BUSTER WILL OFFER NEW FILE SYSTEM

by Clifford Colby, MacWeek

Apple Computer is reportedly working on the next revision of the Mac OS, codenamed Bride of Buster. Sources say the upgrade, Mac OS 8.0.1, is due around the end of the year and will bring new features to Apple's operating system as well as squash bugs.

The update reportedly will replace the Mac OS's current Hierarchical File System with a new volume format. Called HFS Plus and codenamed Sequoia, the format is expected to make much more efficient use of disk space and boost the maximum number of allocation blocks for a volume by reducing the size of the blocks. HFS Plus will let users store files much larger than the current 2GB ceiling and will allow them to save more files than the present limit of 65,536. The revised format is also expected to support file names as long as 255 Unicode characters.

For compatibility, non–HFS Plus users trying to access a disk formatted with HFS Plus will receive instructions on how to access the disk.

Bride of Buster will ship with version 2.0 of Mac OS Runtime for Java (MRJ), sources say. MRJ 2.0 will include support for version 1.1.3 of Sun Microsystems' Java Development Kit.

The revision is expected to include Open Transport 1.3. The update to Apple's networking and communications architecture will include bug-fixes along with what Apple calls single-link multihoming, which will let administrators put multiple Internet-protocol addresses on one Ethernet interface.

According to sources, Mac OS 8.0.1 will come with a new version of LaserWriter printer software—LaserWriter 8 Printer Driver 8.5.1—which will add support for custom page sizes, Adobe PostScript 3 printers, and printing over TCP/IP. The new driver is expected to use Open Transport as its default setting. Sources say the package will also include the Desktop Printer Utility for creating desktop printer icons; the Apple Printer Utility will be an optional install with the update.

The revision will reportedly fix some of the AppleScript bugs that popped up with the new Mac OS 8 Finder. Sources say an interface enhancement will let users click on a triangle to invert a window's sort order.

Navigation Services In tandem with Bride of Buster, sources say, Apple is working on a suite of developer tools called Navigation Services that will assist users in browsing through folders and volumes and opening and saving files.

Once the Navigation Services suite is implemented, users reportedly will be able to move through a file system's hierarchy, navigate to mounted volumes, choose recently used documents, and select translation applications via a single dialog box. They will also be able to select from a Favorite Items menu item that will contain aliases to selected documents, sources say.

Apple was unavailable for comment.

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Circle 15 on reader service card

graphics

Corel Announces Upgrade Path

CORELDRAW 8 SUITE TO INCLUDE PHOTO-PAINT

by Rebecca Gulick, MacWeek

Reaffirming its commitment to the Mac, Corel (613/728-8200, www.corel.com) has announced plans for the next two upgrades of its CorelDraw suite of graphics applications. Version 6.1 of the $595 package, which was due in October, features new Internet publishing capabilities as well as interface tweaks and faster redraws. The suite's components include the CorelDraw illustration application; WordPerfect; CorelDream 3D; Artisan, an image-editing tool; and Texture, software for creating bitmapped textures.

Corel says the interim update lets users assign URLs to individual objects within an illustration and export the graphics to HTML with the images saved as either GIF or JPEG files. CorelDraw 6.1 can create an HTML file that references the image, Corel says. The update includes an export filter for Barista, Corel's Java-based publishing technology for the Web.

Corel says version 6.1 also focuses on improving screen redraws, making the display faster and flicker-free. It supports Mac OS 8's contextual menus and memory-management enhancements, the company says. The update packs 5,000 new clip-art images and a slew of new templates for projects such as creating wedding invitations and restaurant menus.

Meanwhile, the company has sketched out plans for the next major upgrade to CorelDraw, which will include Corel Photo-Paint image-editing software. CorelDraw 8 Suite for Mac, which will debut at the Macworld Expo in January 1998, will offer feature parity and file compatibility with its Windows counterpart, which is slated to climb from version 7 to 8 this November.

An upgrade to version 6.1 costs $20; competitive and cross-platform upgrades are $149 each.

storage

Iomega Updates Jaz and Zip

JAZ DOUBLES CAPACITY; ZIP GETS A SWITCH

by Stephen Beale

Polishing the crown jewels in its product line, Iomega (801/778-1000, www.iomega.com) has introduced new versions of its popular Jaz and Zip removable-storage devices.

All That Jaz The Jaz 2GB works with 2GB removable cartridges, doubling the capacity of the disks used in Iomega's original Jaz. Iomega says the drive is 40 percent faster than its predecessor, thanks in part to an Ultra SCSI connection. In addition to working with 2GB cartridges, the drive reads and writes to the 1GB media used in the original Jaz. Iomega will continue to sell the earlier model, which is limited to working with 1GB cartridges.

The 2GB drive is available now in a $549 internal and a $649 external version. Cartridges cost $169 each or $449 in a package of three. The internal 1GB drive costs $299; the external version costs $100 more. The 1GB disks sell for $125 each or $299 for a three-pack.



KEVIN CANDLAND

Iomega's new Jaz 2GB doubles the capacity of the original jaz.

To use the new drive, you need an Ultra SCSI card; the original Jaz works with the Fast SCSI-2 interface found in most Macs. The cards are available from a variety of sources; Iomega offers one as a $100 option.

The drive ships with a variety of bundled Mac software, including Dantz Development's DiskFit Direct for file backup.

More Zip The new Zip-Plus, which sells for $200, offers several modest enhancements to the original Zip drive, which will still be available for $150.

The drive, which works with standard Zip disks, features a power switch, a lightweight universal power supply, and a cable that incorporates both parallel and SCSI connectors.

It includes full versions of several popular software packages: Adobe PhotoDeluxe image-editing software, DataViz's WebBuddy Web utility, Digital Arts & Sciences' ImageAXS image-management software, PictureWorks Technology's NetCard electronic-postcard software, and Iomega's RecordIt for creating your own music cartridges.

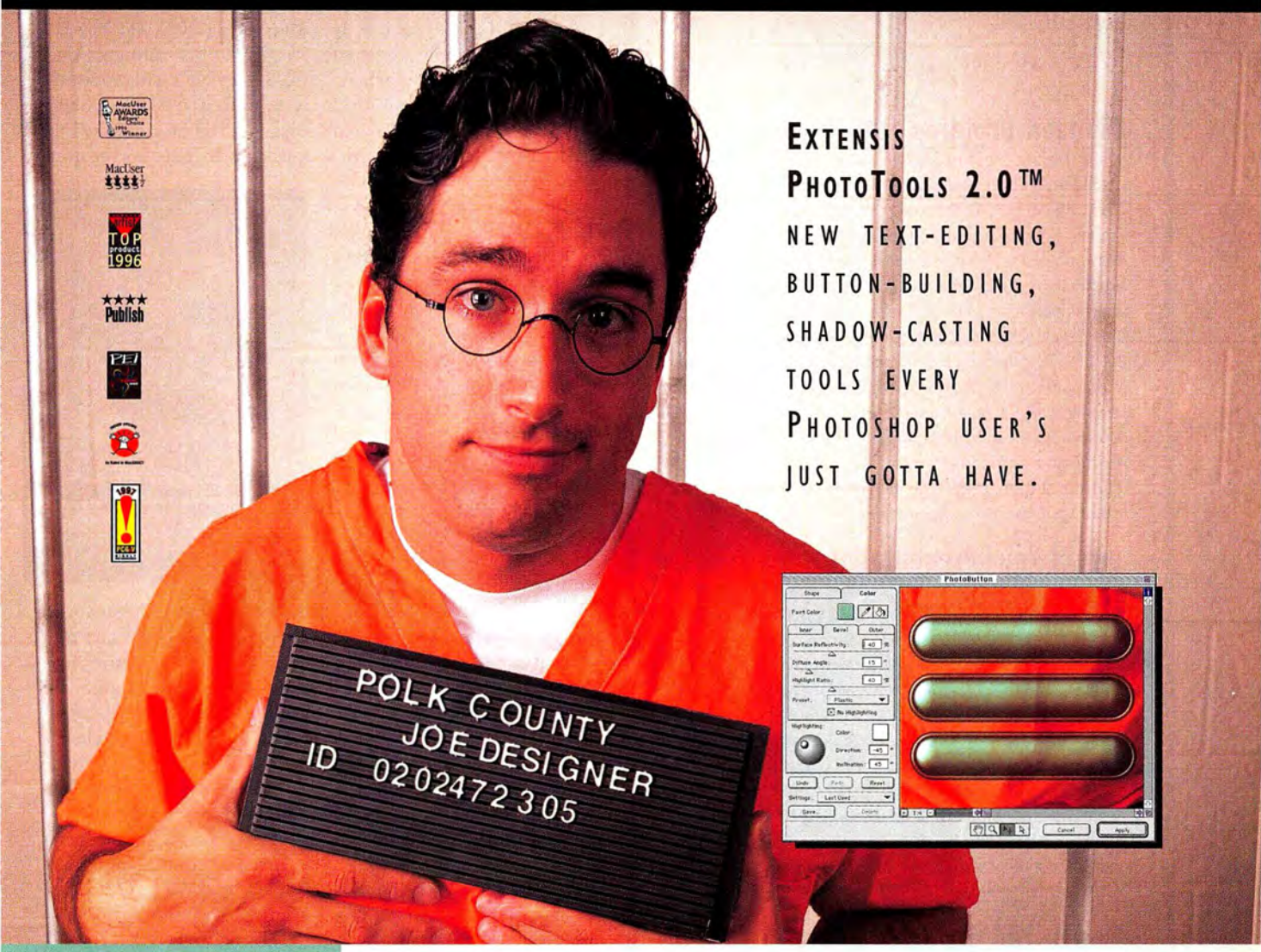
Iomega also announced enhancements to its notebook Zip drive. These include a locking mechanism and head-protection system designed to prevent damage from rough handling. A power-management feature puts the drive in sleep mode after a user-defined period of inactivity. Iomega has licensed VST Technologies (508/287-4600) to market and sell the drive to PowerBook users.

Nomai Lawsuit As Iomega forges ahead with new products, it is also engaged in a nasty legal dispute with Nomai, a French manufacturer that has developed a clone of the Zip disk. Nomai says it will begin U.S. distribution of the Zip-compatible XHD 100MB Super Floppy by the end of the year. Pricing has not been set, but Nomai says the disks will be considerably less expensive than Zip disks from Iomega or its manufacturing licensees, which include Maxell and Sony.

Iomega claims that the Nomai disks infringe on patents, copyrights, and trademarks associated with the Zip media, and has filed two lawsuits against Nomai in European courts seeking to prevent release of the disks.

Ironically, Iomega allied itself with Nomai in 1993 in a similar dispute with SyQuest. Nomai had developed 44MB and 88MB SyQuest-compatible cartridges and signed up Iomega to distribute the media. SyQuest sued Nomai for patent infringement and warned its customers that using the Nomai disks could void the warranty on SyQuest drives. Nomai and SyQuest later settled the suit.

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Media WATCH

BY KELLY RYER, MACWEEK

Pioneer Explores DVD Design

Pioneer New Media Technologies (310/952-2111, www.pioneerusa.com) wants to put a friendly front end on DVD title creation. The company is working on DVDesigner, a $495 authoring program scheduled to ship in November. The Java-based program will run on Macs if Apple ships QuickTime 3.0 and its updated Java virtual machine on schedule, Pioneer says. DVDesigner will offer title developers a way to organize DVD video sequences. Its graphical interface will use flowchart and timeline metaphors to show interactivity and the placement of graphical elements and video scenes. It will record data in a format that can be read by Pioneer's $170,000 premastering and authoring system, but will also produce a generic authoring-decision list that can be used with other systems, the company says.

Direct Your Presentations

If you'd like to control your video presentation, slide projector, or other device from within Macromedia Director, Dataton North America (914/762-0321, www.dataton.com) may have the answer. Dataton's Trax 3.5 software, which hooks up to the company's line of hardware controllers, can now be downloaded free from the company's Web site. Previously, Trax sold for $1,295. Available both as a standalone Mac application and as an Xtra plug-in for Director, the software is compatible with TCP/IP and Apple-events scripting, the company says. According to Dataton, its control systems can be used to manage many types of multimedia devices. A basic four-channel Smartpax QC controller costs $2,410.

Media 100 Retools Lineup

Media 100 (508/460-1600, www.media100.com) has announced an addition to its line of video-editing systems and significant price reductions on its higher-end models.

The $19,995 Media 100 xr replaces the $28,000 Media 100 xs with the HDRfx Option. The HDRfx card enables the system to handle processing simultaneous dual-stream real-time effects, which include 21 dissolve, wipe, and iris transitions; color effects such as black and white, sepia tone, or inverse; audio cross-fades; and the overlay of uncompressed static text or graphics. The Media 100 xr works with native QuickTime files and can capture and compress full-screen, full-motion video at settings ranging from 120:1 to 2:1.

The Media 100 xs, formerly $21,995, now costs $14,995; the xe model, formerly $14,995, is now $12,995.

"JOBS PUSHES APPLE"

continued from page 28

audience of publishing professionals, Jobs pledged that Apple will beef up its investment in such graphics-related technologies as ColorSync and AppleScript as well as in the Mac OS itself. He said that Rhapsody, Apple's forthcoming next-generation OS, will be the company's equivalent to Windows NT, running at first on servers and other high-end products.

A Flurry of Change The Seybold keynote capped a busy two-month period in which Jobs curtailed Mac OS licensing, installed a new board of directors, and forged a well-publicized alliance with Microsoft. Apple marketing chief Guerrino De Luca resigned, and Apple disbanded its R&D and quality-assurance units, moving their functions to other divisions.

In September, Apple announced that it would retain its Newton Systems Group, the unit responsible for the MessagePad 2000 personal digital assistant and the eMate 300 notebook computer. In May, Apple had announced that it would spin off the Newton group into a subsidiary. Jobs said he was enamored of the eMate 300, which until now has been available only to the education market. "We're changing that," he said.

Apple has revised its channel policies, making it easier for small dealers to obtain their systems directly from the company and removing restrictions on which systems the dealers can sell. Apple believes that smaller dealers are more likely than superstores to be Mac advocates.

Network Mac Meanwhile, Apple watchers are awaiting the forthcoming Macintosh-based NC, which has become one of the company's worst-kept secrets.

MacWeek, citing anonymous sources close to Apple, reports that the NC will essentially be a stripped-down Mac with a 266MHz PowerPC 750 CPU running Mac OS 8. The NCs will reportedly be priced at $700 to $800 each and will be connected to a Rhapsody-based server over

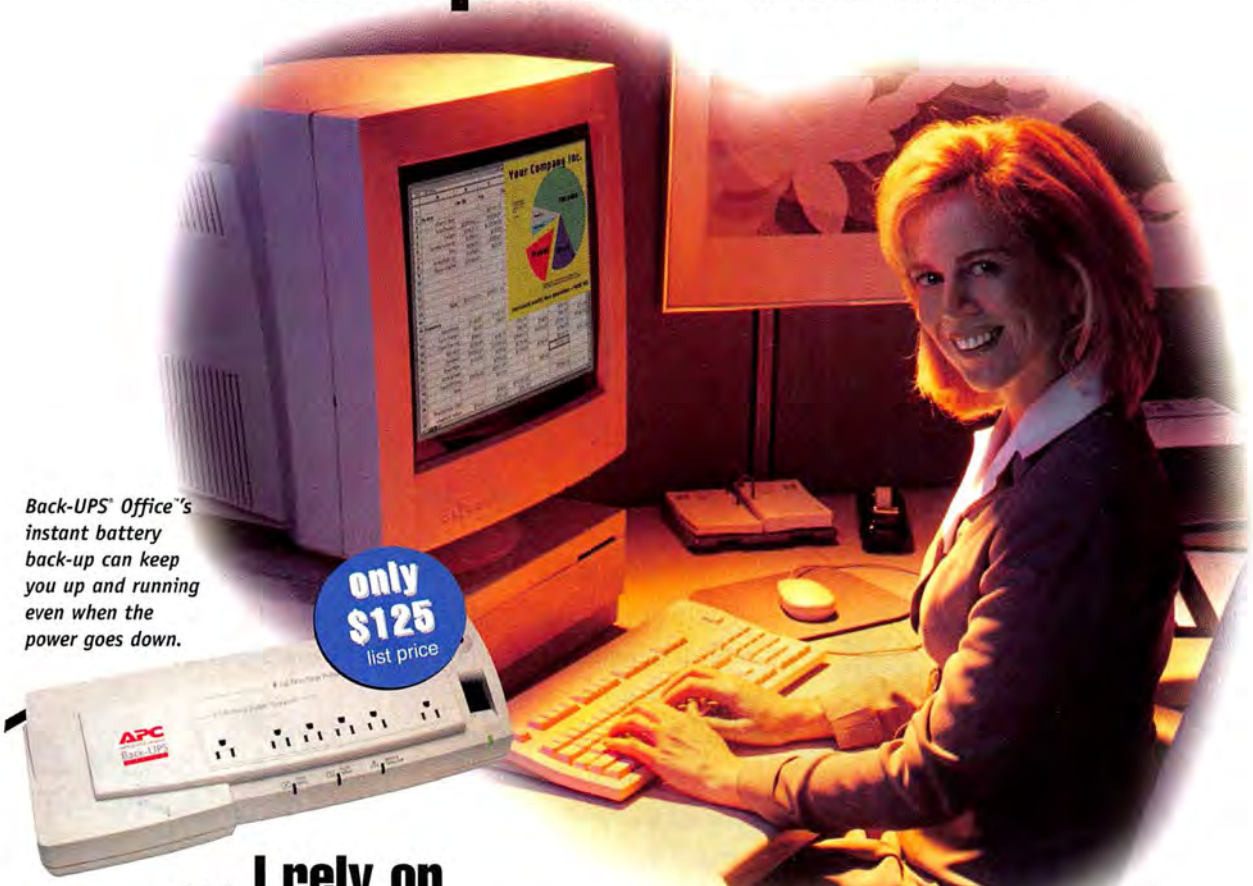


a Fast Ethernet network. *MacWeek*'s sources say the NCs are near completion and will ship in April. Apple will reportedly aim its Mac-based NC at the education and business markets.

Bumps Ahead Jobs has given the Mac market a psychological boost, but prosperity remains elusive. Ironically, Apple's decision to curtail its Mac OS–licensing program could stall its return to profitability as ex-cloners Power Computing and Motorola offer steep discounts to clear inventory. Umax Computer, while it remains a licensee for now, is following suit. The fall quarter is traditionally Apple's strongest for sales.

And the search for a permanent CEO continues. During a Q&A session following the Seybold keynote, Jobs indicated that he is still not interested in being the long-term chief executive. Apple now says that it expects to name a permanent CEO by the end of the year.

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DISPLAY

Portable Presentation Power

The Impression A6 projector, from Ask (201/896-8888, www.ask.no), weighs 11 pounds and offers 1,024-by-768-pixel resolution with 450 ANSI lumens output. The $12,995 projector includes stereo speakers, a remote control, a zoom lens, and a travel case with room for a laptop.



Ask Impression A6

INPUT DEVICES

Set Your Mouse Free

Don't let your mouse trap you at the computer. The GryoPoint Pro II wireless mouse, from iXMicro (408/369-8282, www.ixmicro.com), operates at up to 75 feet from your Mac. It is radio-based, not infrared, so there's no need to aim. The $199 mouse works with existing drivers and runs on two AA batteries.

MULTIMEDIA

Boris Doesn't Bore Us

Artel Software (617/451-9900, www.artelsoft.com) has released Boris FX 3.0. The latest version of the $495 digital-video-effects generator includes new color-correction features; unlimited layers of video and graphics; and the ability to wrap images on cubes, spheres, and cylinders. Also new are plug-ins for Adobe After Effects and Denim Illuminaire, as well as compositing capabilities.



Artel Software Boris FX 3.0

A Walk in the Park

While many developers are getting out of the Macintosh market, Cakewalk Music Software (617/926-2480, www.cakewalk.com) is releasing its first Macintosh product. Metro 3.5 is a multitrack MIDI sequencer suitable for professional-level audio work. The $199 program includes QuickTime synchronization, can be integrated with Macromedia's Deck II, and supports real-time editing.

NETWORKING

File Transfer Made Easy

Farallon Communications (510/814-5000, www.farallon.com) has begun shipping Timbuktu Pro 4.0 for Mac OS, the latest version of its remote-control and file-transfer software. Timbuktu allows any Mac system to communicate or collaborate with another Macintosh or a Windows PC via modem-to-modem, ARA dial-up, Internet, local area network, or wide area network connections. New features include Timbuktu Express file-transfer technology, file synchronization, intercom capabilities, and AppleScript support. This version is optimized for Mac OS 8 and is Open Transport–native. There is also improved AppleGuide help information. Prices range from $53 to $139, depending on the number of users.

ONLINE

For Your Eyes Only

Private File, a new $100 encryption utility from Aladdin Systems (408/761-6200, www.aladdinsys.com), protects information by securing transmissions sent via e-mail, FTP sites, and Web sites. It includes drag-and-drop encryption and decryption and incorporates Aladdin's StuffIt technology for compression. Files can also be marked for compression from within e-mail programs.

PRINTING

No More Film

Are film and developing costs too expensive for you? Olympus (516/844-5000, www.olympus.com) may have the solution with the $399 P-300 Personal Photo Printer, which lets you print photo-quality pictures directly from any Olympus digital camera. It can also be connected to your Mac to function as a small-format dye-sublimation printer. The P-300 can produce a 300-dpi, 4-by-5.5-inch photo in 1.5 minutes.

STORAGE

Disk Management

FWB Software (650/482-4800, www.fwb.com) has upgraded two of its popular ToolKit utilities to support Mac OS 8. Hard Disk ToolKit 2.5 lets users format disks in the background while they're working in other programs. Priced at $199, with an upgrade price of $49, it now ships on a bootable CD-ROM for use in emergencies. FWB's CD-ROM–management software, CD-ROM ToolKit 3.0, offers improved caching, DVD-ROM support, and an adjustable graphic equalizer for audio playback. The utility costs $79; the upgrade costs $29.

UTILITIES/TOOLS

Keep Your Eye on the Cursor

Having trouble seeing your cursor? Biggy was originally designed for the vision-impaired but works for anyone who wants a more legible cursor. Version 3.0, from RJ Cooper & Associates (714/661-6904, www.rjcooper.com), includes 250 new cursors, some animated. The $100 package also lets you create your own cursors and edit them.

Eight-Speed Mac

You've made the move to Mac OS 8; now it's time to get up to speed. Speed Doubler 8 is the latest upgrade to the software-acceleration utility from Connectix (415/571-5100, www.connectix.com). The $55 program works with Mac OS 8 and adds scheduled file copying for automated backup of PowerBooks, removable drives, and networked Macintoshes. Also new are keyboard shortcuts that launch applications, open files, navigate menus, and enter text via single keystrokes. Customers who purchased Speed Doubler 2 on or after July 1, 1997, can upgrade for free.

Good Things in Small Packages

Aladdin Systems (408/761-6200, www.aladdinsys.com) has updated Shrinkwrap, the disk-image utility—previously available as shareware—that lets you save the contents of floppy disks as electronic files on your hard disk. Version 3.0 incorporates Aladdin's StuffIt technology and automatically encodes BinHex files. According to the company, the $30 utility is twice as fast as Apple's DiskCopy 6.1 and saves 30 percent more disk space. Current owners can upgrade for $15.

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Reviews

3-D Design and Animation Tools

THREE PACKAGES' FEATURES CONVERGE, BUT EACH ONE RETAINS SUBTLE STRENGTHS



JAVIER ROCA

VERSATILITY IS THE OVERRIDING virtue of general-purpose 3-D–design packages, such as MetaCreations' Infini-D 4.0 and Ray Dream Studio 5.0 and Strata's StudioPro 2.1. Combining modeling, rendering, and animation components, these programs are suitable for everything from graphic arts and industrial design to Web-site development and cinematic special-effects production.

Strata still defines StudioPro 2.1 as a general-purpose program, while MetaCreations now pushes Infini-D primarily for high-end broadcast and video production and Ray Dream Studio for general-purpose 3-D and graphic-arts work. This marketing strategy differentiates the two products and reflects their strengths, although it ignores Infini-D's widespread appeal; the program may eventually be available only through VARs, a move that will likely isolate it and raise its price.

Product positioning aside, all three programs have become more versatile—and more similar—than ever. For example, Infini-D and Ray Dream Studio now offer vertex-level, mesh-surface modelers, narrowing the modeling gap between themselves and StudioPro.

Infini-D also adds a scan-line renderer, a wonderfully editable particle generator, variable-length tube lights, controls for producing visible (volumetric) light-beam effects, shape deformations that you can "stack" into animatable sequences, and support for Adobe Photoshop and After Effects filters. New video-production features include NTSC and PAL color-correction controls and the ability to vary pixels' aspect ratios. And Infini-D now has a preview-over-video function and a Sequencer audio channel, so you can position models accurately against a background and synchronize motion with a soundtrack before postproduction.

Among Ray Dream Studio 5.0's additions are visible lighting effects, lens flares, shape deformers, a natural-media renderer, primitives that produce natural-looking objects (such as clouds), and controls for applying physical constraints (such as gravity and collisions) to animations. Strata StudioPro 2.1 offers new character-animation tools and new rendering effects, such as visible lighting, lens flares, and motion blurs. Most important, the bugs that plagued StudioPro 2.0 appear to be under control.

Designing Differences

The interfaces of all three programs now offer better tool accessibility and a clean-

REAL PRODUCTS REAL RATINGS
Reviews you can trust: Unlike other publications, Macworld rates only final shipping products, not prototypes. What we review is what you can actually buy.
Outstanding ★★★★★ = 9.0–10.0 Very Good ★★★★ = 7.0–8.9 Good ★★★ = 5.0–6.9 Flawed ★★ = 3.0–4.9 Unacceptable ★ = 0–2.9

er working area, but Infini-D has made the biggest strides; MetaCreations has completely recast it in a style reminiscent of 3D Studio Max while retaining its basic Mac feel. A menu bar replaces the tool palette, and a new context-sensitive Command palette organizes controls for object variables, constraints, deformations, surface attributes, working views, and effects filters (see "Commanding Attention"). Tabs let you switch among sets of controls, and as you select items in the scene, the palette changes to display the appropriate options. The result is an interface that places controls close at hand but minimizes workspace clutter. Ray Dream Studio and StudioPro also offer well-designed tabbed palettes, neither of which achieves the cross-functional integration of Infini-D's Command palette.

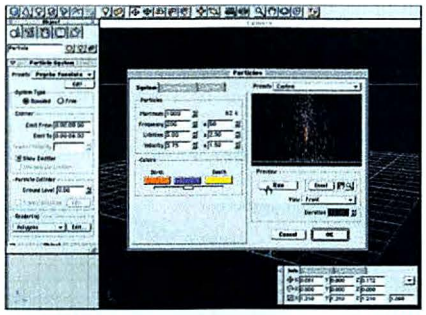
Although Infini-D's and Ray Dream Studio's modeling environments have improved, they still have some catching up to do. In StudioPro 2.1, you do all your modeling in the main scene view, whereas Infini-D and Ray Dream Studio now have separate mesh-surface modelers in addition to separate spline-form modelers for lathings and extrusions.

The mesh modelers in all three are equally competent, but Infini-D's spline modeler is more straightforward than Ray Dream Studio's Free Form modeler. Both StudioPro and Ray Dream have geometry-based Boolean modeling functions; Infini-D still offers only rendering Booleans, which are fine for images but don't alter model geometry. And Ray Dream Studio's camera controls aren't as refined as the others', making it difficult to see exactly what you want in the scene.

Seeing and Doing

All three programs are fine renderers capable of producing professional-quality images. All support QuickDraw 3D; have their own built-in interactive modes; and produce scan-line, Phong, and ray-traced final renderings. StudioPro also offers Raydiosity—a better alternative to ray tracing in some situations—and Ray Dream Studio includes a natural-media renderer that produces illustration-style images. All three let you edit surface and procedural shaders, customize environmental effects, and produce special effects such as lens flares and visible light beams. But only Infini-D and StudioPro can also produce camera motion-blur effects.

For animation, Infini-D's ease of use places the program ahead of StudioPro. Ray Dream Studio trails slightly, lacking such features as velocity graphs for fine-tuning motion; however, Ray Dream offers controls that let you mimic the laws of physics, including constraints for initial velocity and for directional, point, flow, rotational, and damping forces. Infini-D's Animation Assistants produce similar



Commanding Attention Infini-D 4.0's context-sensitive Command palette (left) organizes functions—such as particle editing—clearly and elegantly.

effects, and StudioPro's Global controls simulate gravity and air resistance, though neither program provides the Newtonian precision of Ray Dream Studio.

StudioPro and Ray Dream Studio both offer inverse kinematics; Infini-D still doesn't. Both Infini-D and Ray Dream let you animate object-defining paths, though neither has the flexibility of StudioPro's internal skeletons.

All three programs include particle generators for producing flowing effects, such as fireworks and fountains. But neither StudioPro nor Ray Dream Studio can match Infini-D's particle editability: You can control the size, shape, velocity, and lifetime of particles; the frequency and size of emissions; environmental constraints, including gravity, resistance, and friction; and even the bounce factor, suggesting the effect of tensile properties.

Getting into Motion

Before you get animated, you'll need to evaluate your system configuration. All three products are Power Mac–only and greedy with hardware resources, so a fast Mac is highly recommended. Infini-D and Ray Dream Studio can live reasonably comfortably in a 40MB system. You'll need at least 72MB of physical RAM for StudioPro 2.1. StudioPro also takes up more disk space, consuming close to 100MB if you install everything.

Even with the best hardware available, Ray Dream Studio's performance lags behind that of Infini-D and StudioPro, making the program less suitable for high-volume production houses. But if you're a 3-D novice or simply need to build scenes quickly, neither Infini-D nor StudioPro can match Ray Dream's Modeling and Scene Wizards. These step-by-step dialog boxes take you through the process of building various objects and assembling scenes. They aren't new, but they're great for learning 3-D concepts.

Macworld's Buying Advice

For basic 3-D design, any of these programs will do. StudioPro 2.1 has the most competent modeler and the most complete production environment, but it's the most expensive and places great demand on system resources. Ray Dream Studio 5.0 isn't the best choice for production animation, but it's fine for general design and light-duty animation; its full complement of features and affordable price make it a natural for novice 3-D designers. The best overall choice is Infini-D 4.0: It's the best animator and the best suited for video production, it provides an excellent balance of features, and it's the easiest to use.—CARLOS DOMINGO MARTINEZ

Infini-D 4.0

RATING: ★★★★/8.3 **PROS:** Terrific new interface; first-rate particle generation; easy-to-use tools. **CONS:** Lacks inverse kinematics and geometric Booleans; may desert retail channel. **COMPANY:** MetaCreations (408/430-4218, www.metacreations.com). **LIST PRICE:** $899.

Ray Dream Studio 5.0

RATING: ★★★★/7.9 **PROS:** Well-balanced mix of tools; inverse kinematics and physics-based animation; affordable. **CONS:** Modeler takes time to master. **COMPANY:** MetaCreations (408/430-4218, www.metacreations.com). **LIST PRICE:** $449.

StudioPro 2.1

RATING: ★★★★/8.1 **PROS:** Excellent combination of features; highly competent modeler. **CONS:** Voracious RAM requirements; expensive. **COMPANY:** Strata (801/628-5218, www.strata3d.com). **COMPANY'S ESTIMATED PRICE:** $1,495.

SLS-120

FLOPPY AND ZIP DRIVES HAVE NOTHING TO FEAR

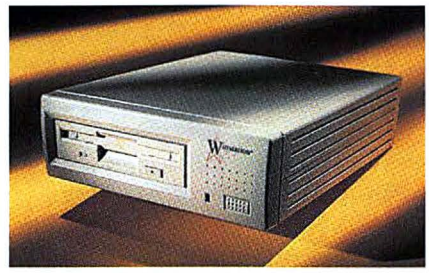
THE 1.4MB FLOPPY DRIVE IS A quaint anachronism in today's world of multimegabyte files, but even Iomega's successful Zip drive hasn't managed to make it obsolete. The latest challenger, the SLS-120, from Winstation Systems, offers the ability to store up to 120MB of data and is compatible with standard 3.5-inch floppy disks. But as long as the SLS-120 lags in performance and reliability, it poses no threat to the balance of power in the removable-media market.

The external version of the SLS-120 drive we tested has a platinum plastic enclosure with manual eject and power buttons, disk access, and power indicators on the front bezel. The case sports two Centronics 50-pin SCSI connectors, an unmarked SCSI-termination switch, a SCSI ID switch, power input, and a small fan. Even though the drive's documentation is amateurish, installing the hardware is a piece of cake.

The meager software bundle has only FormatterOne Pro, from Software Architects (206/487-0122, www.softarch.com), an extension that acts as the device driver, and an application for preparing the media. Even with the drive properly cabled and turned on, the extension takes a long 45 seconds to load during start-up.

With the driver loaded, the SLS-120 reads, writes to, and formats 120MB SuperDisks, from Imation (an offshoot of 3M), as well as 1.4MB, 3.5-inch Mac floppies (neither 400K nor 800K Mac floppies are supported). With Apple's PC Exchange control panel installed, the drive can also use 720K and 1.4MB PC disks, but you can't reformat a PC floppy as a Mac disk (or vice versa) as you can in a standard floppy drive. Other than that, floppies mount and eject in the SLS-120 just as in a standard floppy drive.

The one difference is that the SLS-120 writes a driver to a floppy the first time you insert it, eating up 67K. Preformatted SuperDisks have 118.3MB of



ARNOLD TIOSEJO

available space and are sold in packages of three for $49 (14 cents per megabyte). In comparison, Zip cartridges cost 20 cents per megabyte in small quantities.

When we tried to reformat various SuperDisks, FormatterOne Pro sometimes destroyed the positioning information, rendering the disks useless; we were sometimes able to recover the SuperDisks after force-quitting the application. Winstation is investigating the possibility that these problems were caused by a timing error in the drive's firmware. In the meantime, the company advises using the Install rather than the Format button.

Even after we erased SuperDisks with FormatterOne Pro, we weren't exactly thrilled with the drive's performance or reliability. In Macworld Lab tests, the SLS-120 proved only a third as fast as a Zip drive when using high-capacity disks (see "Compatibility at a Huge Performance Cost"). Some of the slowdown is because the drive ships with write-verification enabled—and unfortunately, there's no way to turn it off with FormatterOne Pro. Floppy-disk performance also leaves much to be desired. When it worked, the SLS-120 required twice as much time as a standard floppy drive when copying files in the Finder. Under Mac OS 8, the computer often froze without warning during long copies, whereas under System 7.6.1, a type 10 Finder-error alert box appeared. These roadblocks occurred repeatedly when writing to various disks and copying various folders. We didn't have any trouble copying the same folders to the same disks, using the Mac's internal floppy drive.

Macworld's Buying Advice

To unseat a market leader, a competitor must offer a compelling advantage, be it superior performance or lower pricing. The SLS-120 offers neither. It's significantly slower than Zip and floppy drives and costs as much as both devices together. Add in questionable reliability and there's precious little reason to recommend this product.—OWEN W. LINZMAYER

RATING: ★/1.6 **PROS:** Innovative design; easy hardware setup; compatible with Mac and PC floppies; economical SuperDisks. **CONS:** Poorly documented; limited software; no support for 400K and 800K disks; flawed floppy compatibility; extremely slow; Finder errors; expensive. **COMPANY:** Winstation Systems (509/765-7759, www.winstation.com). **LIST PRICE:** External, $269; internal, $199; 120MB cartridge, $16.33.

Macworld LAB TEST

Compatibility at a Huge Performance Cost

Best result in test. Shorter bars are better. Times are in seconds. ▶New product.

	FileMaker Search/Sort	Open Photoshop File	Save Photoshop File	Copy to Drive	Copy from Drive	Duplicate Files
Iomega Zip	139.0	80.0	71.0	22.0	21.0	37.0
▶Winstation SLS-120*	332.0	254.0	238.0	64.0	69.0	123.0

* *Write-verification on (fixed).*

Behind Our Tests All drives tested with write-verification off, unless otherwise noted. All tests performed on a Power Mac 7300/200. For detailed information on our test suite, see "Storage to Go," August 1997, or www.macworld.com/tests/.—**Macworld Lab testing supervised by Jeff Sacilotto**



3D solid and surface modeling at its best ...

form•Z



Roger Harris,

of Kent, England, is a freelance 3D illustrator who produces a wide variety of work, ranging from magazine covers to television animations. Not too long ago, he discovered the benefits of computer modeling and graphics and his creativity has been drastically enhanced. How does it work?

As I demand a high standard from myself for all of my projects, I only use the very best software. form•z offers me the tools I need to build anything I want with perfect ease and accuracy. This allows me to explore more designs and do it faster. Then RenderZone lets me render images at the quality myself and my clients demand.

Roger Harris





See for yourself: download a demo for MacOS or Windows from our web site at

www.formz.com.

As a designer, you need to visualize complex forms and to imagine shapes that do not yet exist. You frequently race against insane deadlines, while your clients grow impatient. That's when you need the modeling power of **form•Z**.

form•Z lets you create a vast variety of forms with unprecedented ease. It offers an extensive array of unique 2D and 3D form sculpting capabilities.

Grow a model from simple lines to complex **surfaces** or to true **solids** with a few quick clicks. Shape curved **splines** or **NURBS** surfaces as you slip effortlessly between 2D and 3D views. **Resize** your shape, **stretch** it, **extrude** it, **lathe** it, **sweep** it, **project** it, **unfold** it, **deform** it, apply advanced vertex and edge **rounding** to it. Use **metaformz**, smooth **meshing**, image based **displacements**, or multi-source multi-path **skinning** to create smoothly blended **organic** forms. What's more, **form•Z**'s **Boolean** operations work even better than those found on pricey workstation level modeling packages.

Add as many **layers** as you need, work with floating point **precision** using simultaneous **graphic** and **numeric input**. If you're unhappy with your new design, **unlimited undos** are always at your fingertips.

RenderZone

When you're done modeling, you can use **RenderZone**'s state of the art shader technology to produce your photorealistic images at impressive speeds. Or you can transfer your models smoothly into your favorite animation program, using **form•Z**'s extensive import/export formats. Flexibility of this caliber has made **form•Z** the most effective modeling complement to many popular animation programs.

Now you can also produce **QuickTime VR movies** and view them from within **form•Z**.



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High-End CAD Systems

MICROSTATION 95 AND VELLUM 3D OFFER INDUSTRIAL STRENGTH FEATURES AT INDUSTRIAL STRENGTH PRICES

TWO CAD PROGRAMS DESIGNED for mechanical engineering, architectural, and high-precision product-design applications have recently been updated. Ashlar's Vellum 3D 3.0 and Bentley Systems' MicroStation 95 can serve as stand-alone design systems or can be integrated into CAD workstation environments, making them suitable for small design firms and large corporations alike.

But complementing the products' high-end capabilities are high-end prices. Both are sold only by authorized resellers, and both require an alphanumeric key. MicroStation puts an unclosable, undocumented, and truly irritating "reminder" over the workspace, whereas with Vellum you must use an ADB hardware key even after unlocking the program.

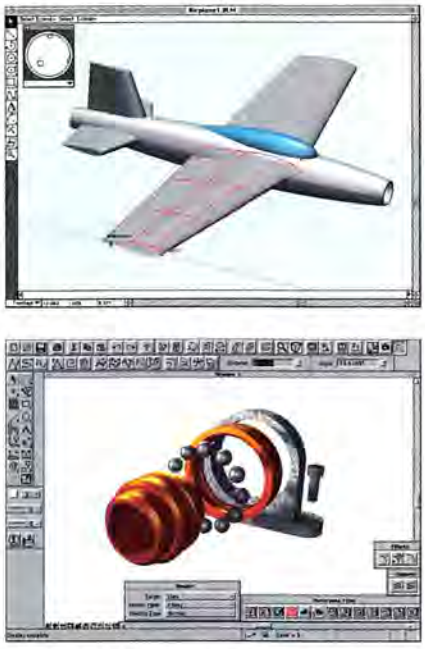
Entering the Station

MicroStation 95 is a complex program that includes almost every imaginable drafting tool, along with high-end staples such as reference files, drawing cells, links to database systems, and a built-in BASIC programming utility for customizing applications.

New in MicroStation 95 is AccuDraw, a drafting aid that evaluates cursor position, tool attributes, and user input to generate coordinates for the next data point. AccuDraw surrounds the cursor with a floating "compass" to which you can snap drawing elements precisely. Although less intuitive than Vellum's Drafting Assistant, AccuDraw is a versatile, nicely designed drafting aid.

Another new tool, SmartLine, builds chains of connected line and arc segments. When used with AccuDraw, SmartLine automatically moves its drawing-plane reference point to each new vertex, making it easy to draw perpendicular segments or (in 3-D) to draw on a different plane.

MicroStation offers more rendering options than Vellum, including a Phong engine for near–photo-realistic rendering, competent lighting and texturing controls, and a nice assortment of surface textures and image maps. Unlike Vellum, MicroStation also includes an animation component, but it's a basic keyframe animator suitable only for architectural walk-throughs, product-orbiting sequences, and solar studies.



The Face of CAD Vellum 3D's clean, well-designed Mac-like interface (top) compares favorably to MicroStation's cluttered, Windows-based approach.

MicroStation's new interface offers floating palettes that you can dock to the edges of the working window. Although the palettes do a decent job of organizing the program's multiplicity of tools, the interface is still visually cluttered and suffers from such foibles as different methods for completing tool actions.

Designing on Vellum

Like MicroStation, Vellum 3D offers high-end features such as parametrics and NURBS surfaces. But Vellum's interface is better designed and more logically integrated, making for a less confusing environment.

Ashlar originated the much emulated concept of the Drafting Assistant, a context-sensitive "smart" cursor that suggests logical tool actions and that displays temporary construction lines for precise alignment. With its continuous feedback, it's still one of the best drafting aids around.

Lacking the construction shortcuts offered by editable primitives (such as those in MicroStation), Vellum requires that you build 3-D objects by extruding or lathing profiles or simply by constructing the wireframe line by line. Its spline-editing approach differs from that of most 3-D modelers, but once you've grasped how to use it, you'll find it straightforward and extremely versatile.

Vellum 3D 3.0 introduces Auto Surfacing, a function that automatically builds surfaces over a wireframe model—allowing for holes and pockets in the model—via a single command. Surfaces remain distinct from the wireframe, so you can delete them if you want to change the model geometry or you can separate the surfaces from the wireframe and edit them individually.

Although Vellum 3.0 includes editable lights, it lacks the rendering versatility of MicroStation. Still, its flat shading is more than adequate for design visualization. For photo-realistic output, you must transfer models (Vellum supports DXF, IGES, and I-DEAS formats) to more-competent renderers.

Macworld's Buying Advice

MicroStation 95 is part of a comprehensive design system that includes a 3-D modeler and various application-specific modules, while Vellum's versatile design environment and more approachable interface give it a clear advantage over MicroStation. Neither is designed for general-purpose 3-D modeling, but for drafting-based 3-D CAD, both are first-rate.—CARLOS DOMINGO MARTINEZ

MicroStation 95

RATING: ★★★★/7.5 **PROS:** Excellent CAD tools; rendering options; comprehensive design environment. **CONS:** Cluttered, inconsistent interface. **COMPANY:** Bentley Systems (610/458-5000, www.bentley.com). **LIST PRICE:** $3,995.

Vellum 3D 3.0

RATING: ★★★★/8.1 **PROS:** Well-defined interface; excellent CAD tools. **CONS:** Lacks rendering options. **COMPANY:** Ashlar (408/487-9800, www.ashlar.com). **LIST PRICE:** $2,995.



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Digitizing Graphics Tablets

ACECAT III BUCKLES UNDER PRESSURE FROM THE SUPERIOR ULTRASLATE

TWO DIGITIZING GRAPHICS TABlets have hit the scene, trying to entice you to toss your mouse out the window. Acecad's entry-level Acecat III comes up short, while the comfortable stylus and ultra-convenient new features of CalComp's UltraSlate will have your mouse scurrying for safety.

Graphic artists have long found it easier to draw using a penlike stylus on a digitizing tablet, because doing so is similar to drawing. The fine cursor control of these graphics tablets makes it not only easier to draw but also to select menu items, drag files from one folder to another, and highlight phrases in a word-processing application. You can leave your mouse connected when you've got a tablet plugged in, but chances are you'll rarely touch it.

The Bare Minimum

The Acecat III fits the bill as a simple mouse replacement but not much else, partly because of its diminutive size: its overall 8-by-9.5-inch rectangular shape includes a mere 5-by-5-inch drawing area. (Acecad also offers pricier tablets with drawing areas of 12 by 12 inches and 18 by 12 inches.)

Even more disappointing is that the Acecat III can't sense how hard you're pressing the stylus, making it unsuitable for many artistic endeavors. Pressure-sensitive tablets—now de rigueur for high-end illustration—work with numerous compliant graphics applications to mimic actual pens, crayons, brushes, and markers. Lines get thicker or more opaque when you press harder, and thinner or more transparent when you ease up on the pressure.

But is the Acecat III a decent mouse replacement for nonartists? It *is* ergonomically well designed, tilting downward slightly and offering plenty of room on both sides and the bottom of the drawing area to rest your hand. A clear plastic overlay holds postcard-size papers in place, allowing you to trace them more easily. Unlike its predecessor, which offered an awkward serial connection, the Acecat III conveniently links to the Mac's ADB port. Using a control panel, you can customize two easy-to-reach side buttons on the stylus to single-click or double-click or to invoke keyboard combinations.

But there's one more hitch: Unlike other products in this category, the Acecat III has its stylus permanently tethered to the tablet—you have to keep flicking the desk-cluttering cord out of the way as you use it. Even weekend artists deserve a better tool than the Acecat III.



SUZANNE ROADY

Acecat III (front) and UltraSlate

All of the Toys

In contrast, CalComp's pressure-sensitive, 6-by-9-inch UltraSlate sports a cordless pen, one of many new features that help it pay the price of admission into any artist's studio. The new battery-free stylus (a feature that until now was exclusive to competitor Wacom Technology's tablets) is the UltraSlate's biggest improvement over its predecessor, the DrawingSlate II (see *Reviews*, June 1995). The absence of batteries means you don't have to worry that they'll die in the middle of an important project, but it also means that the stylus is no longer top-heavy and feels remarkably like a real ink pen.

Topping the list of the UltraSlate's conveniences is a feature that lets you set pop-up hot keys that work within any application and within the Finder. Once you configure the UltraSlate's control panel, you can press one of the two buttons located on the side of the stylus to activate a pop-up menu on screen. This menu sports a customized list of keyboard-activated items that you can use to invoke commands such as Undo, Save, and Quit. Tap on the list to enact a command, and the menu automatically disappears, letting you quickly access keyboard equivalents without looking away from your screen.

Weighing in at 1.7 pounds and measuring less than half an inch thick, the UltraSlate rests easily in your lap or on your desk. The cord that attaches the tablet to your Mac's ADB port is wisely centered on the top edge of the tablet, out of the way for both right-handed artists and lefties alike.

Macworld's Buying Advice

All of the Acecat III's shortcomings could be forgiven if it were priced dramatically less than the competition to appeal to those nonartists and others who would be happy to trade features for significant savings. But it isn't. If you're in the market for a small-size tablet, CalComp's 4-by-5-inch DrawingSlate II offers more features at about the same sub-$100 street price; CalComp's fancier 4-by-5-inch UltraSlate (a smaller version of the model reviewed here) costs just $30 more.

The 6-by-9-inch UltraSlate offers all the features that professional artists demand and many conveniences that even nonartists can appreciate. And it's a real value, too. With a street price below $300, it costs less than rival Wacom Technology's similarly-sized ArtZ II model (see *Reviews*, December 1995).—SHELLEY CRYAN

Acecat III

RATING: ★★/4.4 **PROS:** Ergonomic design. **CONS:** Corded stylus; not pressure-sensitive; competing products offer a better value. **COMPANY:** Acecad (408/655-1900, www.acecad.com). **LIST PRICE:** $129.

UltraSlate

RATING: ★★★★★/9.1 **PROS:** Cordless, battery-less stylus feels like a traditional pen; customizable pop-up hot keys. **CONS:** None significant. **COMPANY:** CalComp (714/821-2000, www.CalComp.com). **LIST PRICE:** $340.



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Photoshop Filters

PLUG-INS EASE MASKING AND COLOR CORRECTION

MASKING AND COLOR CORrection are the two most time-consuming tasks image-processing pros face, the former requiring painstaking precision and the latter demanding skill and experience. Two new Adobe Photoshop plug-ins, Chroma Graphics' MagicMask 1.0 and Extensis's Mask Pro 1.0, go a long way toward banishing the drudgery of building complex image masks. Another Photoshop filter, Extensis's Intellihance 3.0, takes the guesswork out of color correction, combining accurate, consistent calibration with simplicity of operation.





Masking Differences The patches of ocean showing through the palm tree must be masked manually in Mask Pro (top). MagicMask's automated, noncontiguous-masking brush clears out the pixels more easily, although you'll need to do some touching up.

Masked Marvels

Both MagicMask and Mask Pro let you create masks by specifying which image colors to drop, but they approach the task differently. In Mask Pro, you use the Eyedropper tool to select colors and then you paint the mask manually. MagicMask's brushes are more intelligent: you drag the Color and Pixel brushes over an image, and they automatically select the colors beneath the stroke and mask all contiguous pixels. MagicMask can also select colors in noncontiguous areas of an image, giving it an advantage over Mask Pro for tough masking problems. Another feature exclusive to MagicMask is the ability to produce variable-density masks based on the average value of the selected colors.

If you make a mistake with either plug-in, you can restore parts of the image. MagicMask offers the restoration equivalents of its Color and Pixel brushes. Mask Pro gives you a standard paintbrush, bucket, and airbrush, along with the Magic Fill tool for touch-ups and the Magic Wand for masking out large areas.

MagicMask offers a complete set of general selection tools, including marquee, lasso, and polygon; Mask Pro provides only a pen tool. And MagicMask has the Magic Lasso, which senses the boundaries of pixel groups and automatically snaps to their edge: you simply move the lasso along the edges. But when it comes to managing colors, Mask Pro has the edge; its Drop and Keep palettes let you specify multiple color sets for an image, and you can preserve color sets and other parameters by saving the entire workspace. Mask Pro also has the Navigator palette for traversing an image quickly. However, I found MagicMask's interface easier to use; Mask Pro's five palettes sometimes got in the way as I zoomed and panned around the image. Both plug-ins offer generously sized previews and zoom tools for close-up work.

Intelligent Color

Most Photoshop veterans are already acquainted with Extensis's Intellihance, a color-correction filter that transforms drab scans into sharper, more richly hued images with a single click. Intellihance 3.0 analyzes the image, compares it with a default (or user-defined) set of preferences, and applies the corrections.

New in this version are a resizable Preferences dialog box with a large, zoomable preview; histograms displaying the pixel values of the original and enhanced images; and a numerical readout of luminance and saturation values at the pixel level. In addition to new pop-ups for controlling tonal cast and descreening images, version 3.0 adds a subdialog box containing professional-level controls for making manual corrections. The new box lets you adjust cast, tone (including a virtual light meter), sharpness, and saturation and apply descreening and despeckling corrections. The result is a more versatile tool that's better suited to the demands of professional users.

Still, Intellihance retains the simplicity of operation that makes it so useful for novices. Its one-click default mode works wonders on fuzzy, hazy images. Unfortunately, Intellihance takes over your Mac, so you can't even pop out to the Finder without closing your work.

Macworld's Buying Advice

For color correction, Intellihance 3.0 is simple to use and delivers consistent results. If you regularly bring images directly into Photoshop, you won't want to be without it. Mask Pro and MagicMask make masking a whole lot easier. Your individual working style will have a large say in which works better for you, but MagicMask's price—some $200 less than that of Mask Pro—may speak even louder.—CARLOS DOMINGO MARTINEZ

Intellihance 3.0

RATING: ★★★★/7.7 **PROS:** Easy-to-use color correction; new pro-level controls. **CONS:** Takes over the Mac while running. **COMPANY:** Extensis (503/274-2020, www.extensis.com). **COMPANY'S ESTIMATED PRICE:** $99.95.

MagicMask 1.0

RATING: ★★★★/7.6 **PROS:** Well-conceived automated masking tools; excellent selection tools. **CONS:** Doesn't provide information on masked colors or saved color sets. **COMPANY:** Chroma Graphics (650/685-6800, www.chromagraphics.com). **COMPANY'S ESTIMATED PRICE:** $99.95.

Mask Pro 1.0

RATING: ★★★★/7.3 **PROS:** Excellent masking tools; saves color sets. **CONS:** Manual operation only. **COMPANY:** Extensis (503/274-2020, www.extensis.com). **COMPANY'S ESTIMATED PRICE:** $299.95.

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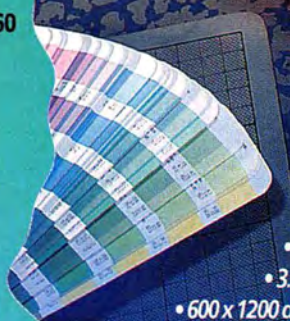
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Digital-Portfolio Creators

ENTRY-LEVEL MULTIMEDIA AUTHORING

MULTIMEDIA AUTHORING CAN be intimidating, but two entry-level programs make it surprisingly easy to combine graphics, text, sound, and movies to create sophisticated presentations. ProView 2.0, the latest version of E-magine's back-to-basics authoring package, lets you create fully interactive presentations with a minimal learning curve; Slides & Sound Plus 1.3, InMedia Presentations' disarmingly straightforward slide-presentation program, is geared toward home users. Neither offers the high-end authoring features of Macromedia Director or Authorware, but either is perfect for creating simple digital portfolios and catalogs for both Macs and PCs.

Easy Does It

ProView's strength remains its streamlined, no-frills approach to assembling a presentation. As in the previous version,



Click and Search In ProView, you can add interactive buttons that let viewers search for text strings or the name of a specific movie or picture.

you add pictures, movies, and text boxes to each page in a project by clicking on buttons or by dragging files—PICT or JPEG images, QuickTime movies, and text clippings—from the desktop onto a ProView page. You can also draw hot spots anywhere on a page for playing sounds or navigating to other pages. By attaching sounds to individual pages, you can create a soundtrack that plays smoothly throughout a presentation. New features include master pages, a search engine, and support for QuickTime VR movies. Accompanying these enhancements, unfortunately, is a hefty price hike—from $99 to $199.95.

Slides & Sound Plus takes a more basic approach, displaying a series of images from a digital camera, scanner, or PhotoCD in slide-show format. You can bring images in directly from several popular digital cameras, along with PICT, GIF, JPEG, and TIFF graphics. The Slide Arrangement window displays thumbnails of the imported images; you can crop, rotate, and drag them into any order.

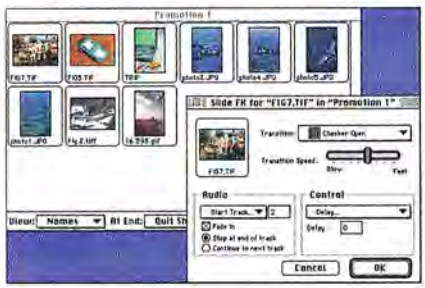
Like ProView, Slides & Sound Plus has some sophisticated features that let you incorporate sound and movies into a presentation. You can have each slide play a sound file or a selected track from an audio CD; overlay one image on top of another; add a QuickTime movie; and add one bullet point at a time. Overall, however, Slides & Sound Plus feels a bit rough around the edges. For example, clicking on a slide in the Slide Arrangement window doesn't open or let you preview the slide, as you might expect it to; even the Preview Slide command displays only scaled-down versions of imported images, not full-size previews.

Transitions and Interactivity

Both programs let you add limited transitions and interactive control to a presentation. ProView's sole transitional effect—a fade to black—looks great, but it works only when pages are displayed full-screen. On the other hand, with ProView you can create a fully interactive project that lets users navigate directly to specific pages, play sounds and movies, or quit a slide show in progress. Unfortunately, you can't combine ProView's slide-show features with interactivity—a project must be either a self-running slide show *or* an interactive, button-driven presentation.

Slides & Sound Plus offers much more in the way of transitions but less interactivity. It supports a variety of transitions, and you can vary their speed with a slider bar. Designed for creating linear slide shows, the program lacks tools for adding hot spots and buttons; the only way viewers can interact with a slide show is by clicking on the screen to advance to the next slide. But unlike ProView, Slides & Sound Plus lets you mix self-running and interactive portions of a project.

ProView projects can be saved as stand-alone, freely distributable presentations. Version 2.0 lets you create Windows-compatible versions as well, although some of ProView's cross-platform capabilities are limited. With Slides & Sound Plus, the final product is also a stand-alone, double-clickable player application. You compile the presentation for either a Mac or a PC and e-mail



Show and Tell Slides & Sound Plus lets you drag imported images into any order and add transitions, speed controls, and an audio track.

it over the Internet from within the program. Oddly, there's no way to save a project for PC playback *without* e-mailing it.

Macworld's Buying Advice

As a tool for turning a series of digital photos into an electronic slide show, Slides & Sound Plus succeeds admirably—and at an unbeatable price. ProView, while no longer a bargain, is a strong presentation tool that produces good results with minimal effort.—JOSEPH SCHORR

ProView 2.0

RATING: ★★★★/7.1 **PROS:** Simple, intuitive interface; creates Macintosh and Windows players; supports QuickTime VR. **CONS:** Can't combine self-running and interactive elements; limited transition options. **COMPANY:** E-magine (212/665-0030, www.e-magine.com). **LIST PRICE:** $199.95.

Slides & Sound Plus 1.3

RATING: ★★★/6.6 **PROS:** Inexpensive; can overlay bullets and captions on slides; numerous transitions; can use music directly from audio CDs. **CONS:** Unintuitive interface; no way to preview transitions; limited interactivity. **COMPANY:** InMedia Presentations (604/893-8955, www.inmediapresents.com). **LIST PRICE:** $69.95.



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Midrange LCD Projectors

FOUR NEW UNITS UNDER 16 POUNDS, $8,500

CLUNKY OVERHEAD PROJECTORS have gone the way of the mastodon with the rise of notebook computers and portable multimedia projectors. Now there's a new crop of 24-bit projectors weighing less than 16 pounds, perfect for traveling presenters. We looked at four units, each costing less than $8,500: the In Focus LitePro 720, Lightware Viewpoint 800, NEC MultiSync MT810, and Proxima Lightbook LB20. These projectors leave top-rated products from just a few years ago in the dust while leaving a smaller hole in your pocketbook.

Speedy Setup

Most presenters are nervous enough without having to deal with hardware problems, and a good projector should make things as easy as possible. Quick connection and setup are essential, and all the units we tested behaved reasonably well.

All four projectors use SVGA—a PC video standard—as their main input, so connecting them to your Mac requires a little extra hardware. NEC offers the best solution to the problem; the MultiSync MT810 uses a clever cable with a Mac video connector on one end and a PC VGA connector on the other. The NEC projector has Mac and PC video connectors on its rear panel; if you're hooking it up to a Mac, you plug the Mac end of the cable into your computer and plug the VGA end into the projector. To connect a PC, simply turn the cable around.

The In Focus LitePro 720 connects to your computer via the company's Cable Wizard, a connection box that has monitor pass-through, Mac and PC inputs for RGB video, audio, and a mouse. The Cable Wizard has active electronics that sense what sort of computer is connected and adjust the projector to the appropriate video standard and resolution. The Proxima and Lightware units use separate Mac-to-VGA video adapters, which are small and easy to lose. All the projectors come with RGB inputs, composite-video and S-Video inputs, and audio jacks.

The In Focus and NEC units have a similar design—a square case with a projection lens on the front. The compact Proxima Lightbook LB20 folds up for storage to a 5-inch-tall package; to open it, you slide the top half of the projector's body toward the front to expose the input connectors and then flip up the lens cover on the front of the box. The Lightware Viewpoint 800 has a projection lens that unfolds from the top of the unit.

How Do They Look?

The most important aspect of any multimedia projector is its image quality. Using all four projectors with a PowerBook in 640-by-480-pixel mode (set to thousands of colors) yielded good results, although some were better than others. The NEC MultiSync MT810 offered the best image quality, followed closely by the In Focus LitePro 720. These projectors were the brightest of the group; their images were sharp and clear, with vivid colors, dark blacks, and bright whites. Picture resolution was excellent, with little or no video smearing. Both projectors offer speedy response times for moving video, such as QuickTime movies and PowerPoint presentations with slide-transition effects.



SUZANNE ROADY

From left: NEC MultiSync MT810, Lightware Viewpoint 800, Proxima Lightbook LB20, In Focus LitePro 720

Lightweight Contenders: Portable LCD Projectors

	In Focus LitePro 720	Lightware Viewpoint 800	NEC MultiSync MT810	Proxima Lightbook LB20
Star Rating	★★★★/7.5	★★★/6.3	★★★★/7.9	★★★★/7.4
List price	$8,499	$2,995	$8,495	$4,999
Phone number	503/685-8888	503/641-7873	630/467-5000	619/457-5500
Web address	www.infocus.com	www.lightware.com	www.nec.com	www.proxima.com
Resolutions (pixels)	640 × 480, SVGA	640 × 480, SVGA	640 × 480, 832 × 624,* SVGA	640 × 480, SVGA
Video	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC, PAL, SECAM
Rated brightness (ANSI lumens)	450	270	550	200
Zoom	yes	no	yes	no
Internal speaker	1	2 (stereo)	2 (stereo)	2 (stereo)
Weight (pounds)	12.0	9.3	15.5	11.4
Carrying case	optional	yes (hard case)	optional	yes (soft case)

*Picture is compressed to 800 × 600 pixels.

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Circle 66 on reader service card

The NEC unit is rated at 100 lumens more than the In Focus projector and definitely looks brighter in action, but both yield very good, bright pictures in a lighted conference room.

The other two projectors are rated at much lower brightness levels (270 lumens for the Lightware Viewpoint 800 and 200 lumens for the Proxima Lightbook LB20) but are still able to project adequately in a lighted room. The Lightbook LB20's picture seemed a bit sharper than the Viewpoint 800's when showing slide shows from presentation software.

Any of these projectors would do well in a conference room in front of a dozen people, but you should look to the NEC and In Focus units—with their higher brightness ratings—if you plan to project to a big screen, use rear projection, or present to a large audience.

The story on picture quality changed when we tried projecting NTSC video from a laser-disc player. The LitePro 720 is the clear winner, with a great projected image and excellent color balance. The Lightbook LB20 is next in line in video-image quality. In our tests, its color fidelity was good but was dimmer than the LitePro 720's. The MultiSync MT810 produced a bright, adequate picture but with a hard, slightly grainy quality indicative of too much digital video processing. The Viewpoint 800 fared the worst with NTSC video, yielding an unpleasant picture heavy with digital-processing artifacts that resembled a mosaic. (Calls to Lightware's tech support went unanswered.) The Viewpoint 800 also had trouble keeping up with movement.

The NEC and In Focus projectors have zoom capability, letting you easily resize an image to fit a projection screen. The NEC unit is especially nice, because you can adjust zoom and focus from a remote control. With the LitePro 720, you have to adjust rings on the front of the projector manually. To modify the image size with the Proxima and Lightware units, you have to move them closer to or farther from the projection surface.

Differences in the level of fan noise among the units became apparent when we used them to watch movies from a laser disc. Once again the In Focus projector stood out, with the quietest fan. The loudest unit was the Lightware Viewpoint 800, which has a large fan on the back that can drown out presenters.

All four projectors offer built-in speakers with sound levels adequate for a medium-size conference room. The LitePro 720—ironically, the only single-speaker unit—has the best sound quality. The other projectors claim stereo sound, but their speakers are so close together that any stereo effect is minimal.

Other Conveniences

All the projectors come with remote controls, but two are especially useful. The NEC remote control has a built-in laser pointer and excellent ergonomics; it's well laid out and significantly easier to use than any of the others. The Lightbook LB20 comes with two remote controls: one with full controls and one tiny unit with simple forward and back functions. The MultiSync MT810 has infrared receivers on all four sides, so you can control it from anywhere in the room. The LitePro 720 has similar receivers on the front and rear, and the other two projectors have single receivers on the front.

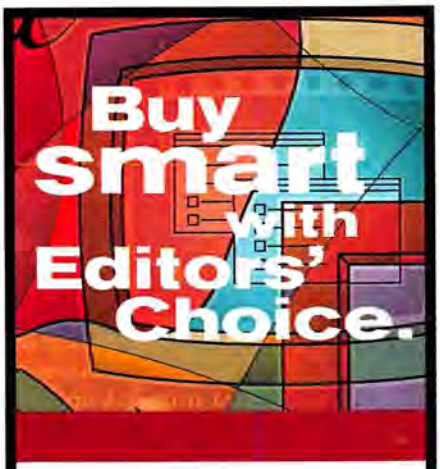
All the projectors have integrated handles for easy carrying. The Lightbook LB20 has a soft case with a shoulder strap, and the Viewpoint 800 has a hard shell case that holds the projector and all the necessary cables and adapters.

If you're planning presentations for the road, take a close look at the lighter Viewpoint 800 (just over 9 pounds) and Lightbook LB20 (about 11 pounds). The 12-pound In Focus unit, with its optional carrying case, is also well worth considering. By contrast, the MultiSync MT810 tips the scales at more than 15 pounds without the optional carrying case.

Macworld's Buying Advice

The NEC MultiSync MT810 has a smart design and projects the best and brightest image from a PowerBook. It's the winner by a nose over the In Focus LitePro 720, which costs about the same and does a better job with NTSC video. The Proxima Lightbook LB20 costs about $3,500 less than the NEC and In Focus units and offers a fine, although not brilliant, image in a very portable package. This is the unit I'd want if I were going on the road for an extended sales trip.

At press time, the price of the Lightware Viewpoint 800 plunged from $6,995 to $2,995, making it the bargain of the group. If you're comfortable with sacrificing product polish for dollars in your pocket and never plan to project NTSC video, look at this unit.—TOM NEGRINO

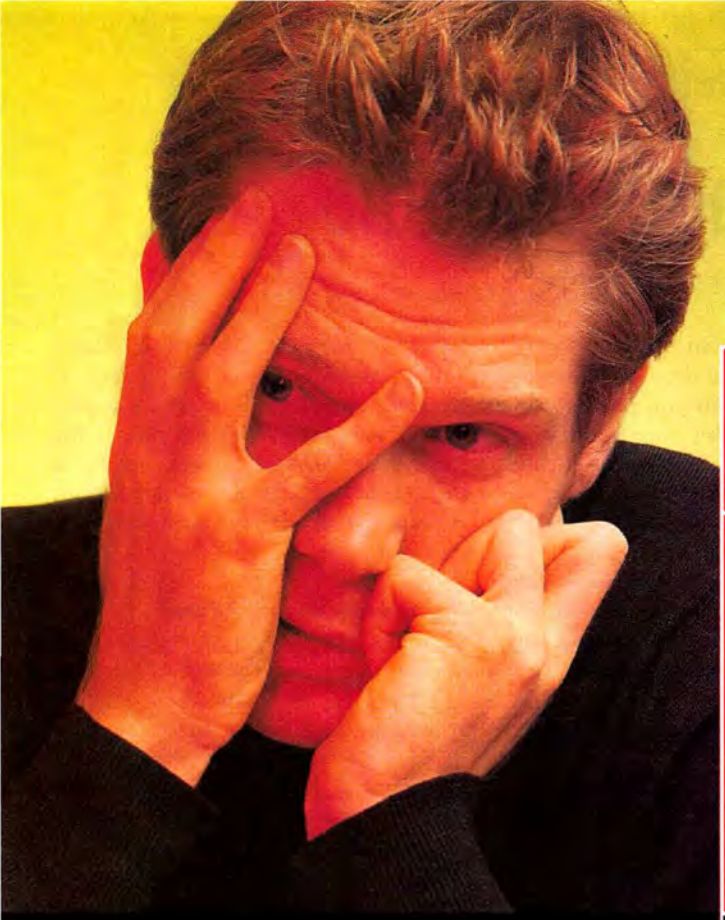


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Circle 53 on reader service card

Authorware 4 Interactive Studio

PREMIER COURSEWARE-DEVELOPMENT SUITE WIDENS ITS LEAD

MACROMEDIA DIRECTOR MAY well be the talk of the coffeebar scene, but the buzz in faculty lounges is Macromedia Authorware. Aimed at the computer-based–training market, Authorware boasts unmatched features for creating interactive tests and tracking students' progress as they work through an interactive project. Version 4 widens Authorware's lead over competing products by adding productivity-boosting interface enhancements and built-in network and Web support.

Authorware 4 Interactive Studio also includes the multimedia authoring tool Director 6, the SoundEdit 16 audio editor, and the xRes image editor (see *Reviews*, September 1997). For those who are just getting started with authoring, this suite will provide the key pieces they need. But if you already have sound- and image-editing applications and you don't need to add Director's animation features to your tool box, you can forgo getting the bundle and purchase Authorware 4 separately for $1,999.

Building Interactivity

Authorware's basic operating style is unchanged in this version: you create an interactive production by drawing flowchartlike diagrams whose interconnected icons control how the project plays back. Some icons cause the project to branch to different areas depending on user choices; others play sounds, display QuickTime movies, perform calculations, and more.

With all these icons at your disposal, fleshing out the structure of a project can be daunting, especially for beginners. Fortunately, Authorware addresses this concern by providing a library of canned templates for common tasks: a content template provides the structure for an entire interactive production, and a variety of quiz and question templates handle interactive testing, complete with scoring and user-tracking features.

As with previous versions, you can build screens by importing graphics, text, and multimedia elements created with other programs; Authorware 4 lets you import media elements by dragging and dropping them from the Finder. Screen-layout features help you position and align elements, draw simple lines and boxes, and create text. Alas, Authorware still doesn't support text antialiasing and kerning—two capabilities Director has offered for more than a year.

Macromedia has greatly enhanced the program's built-in help system, adding more details, dozens of animated examples, and links to the company's Web site.



Live Imagery This screen from a hypothetical travel CD-ROM contains a link to a live Web-cam image. By taking advantage of this new feature, your projects can always contain up-to-date images.

Also new in this version is the ability to save a completed production as a standalone application that runs under the Mac OS or under Windows 3.1, 95, or NT.

Working the Network

Unlike previous versions, Authorware 4 lets you create links between a project file and external media files. This capability streamlines development and lets you create productions whose content Authorware automatically updates when you change a linked file.

Not surprisingly, Authorware 4's linking capabilities extend to the Web. Type a URL instead of a file name into Authorware's Image dialog box, for example, and you create a link to a live image on the Web. When your project runs, the image automatically updates (see "Live Imagery"). This feature makes Authorware an ideal tool for creating hybrid projects with both CD-ROM and Web content.

With the new Authorware Afterburner, included with Authorware 4, you can prepare a production for playback in a Web browser. This Shockwave for Authorware browser plug-in supports streaming, so you can divide a project into segments that don't download until they're needed.

Macworld's Buying Advice

Although its flowchart approach to interactivity is easier to get accustomed to than the timeline scheme that Director uses, Authorware remains a complex application that takes users some time to master.

If you mainly want to create simple projects that don't require testing and progress tracking, you may want to consider getting Pitango's ClickWorks (see *Reviews*, February 1997), an alternative program that offers a combination of approachable, flowchart-style authoring features and excellent Web support. For those who want to develop interactive courseware, however—particularly if they are interested in deploying their efforts on the Web—there's no better tool available than Authorware 4.—JIM HEID

Authorware 4 Interactive Studio

AUTHORWARE 4 ★★★★/8.2

INTERACTIVE STUDIO ★★★★/7.8

PROS: Streamlined development features; excellent Web and media-linking features; thorough documentation and built-in help. **CONS:** Still lacks antialiasing and kerning functions; steep learning curve. **COMPANY:** Macromedia (415/252-2000, www.macromedia.com). **COMPANY'S ESTIMATED PRICE:** $2,999; Authorware 4 only, $1,999.

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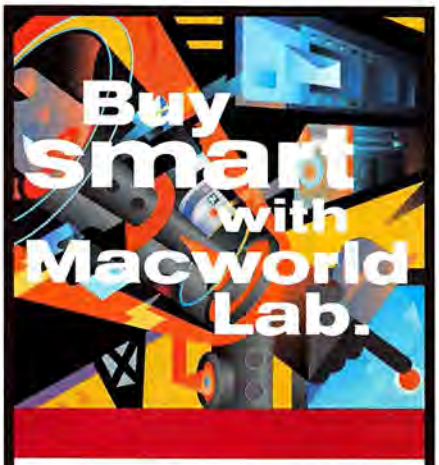
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FastTrack Schedule 5.0

SIMPLE PROJECT-MANAGEMENT SOFTWARE ADDS HIGH-END FEATURES

THOSE WHO WANT TO MANAGE projects without having to bone up on theory will like AEC Software's FastTrack Schedule. Version 5.0 adds features usually saved for high-end project-management software—such as custom calculations and conversion of schedules into HTML—without sacrificing the product's easy, timeline-oriented scheduling approach.

To begin a project, simply click in a workspace, enter activities, and indent them into an unlimited number of outline levels. You can prioritize tasks by dragging and dropping them into a different order. Version 5.0 lets you define recurring values (such as start dates) for any data column and save them, for faster entry.

Another new time-saving feature automatically draws a timeline bar when you type a single value, such as a duration. You can select from a library of more than 200 bar styles and draw bars directly in the chart area; FastTrack then enters dates for you in the appropriate columns. Because you can factor holidays, weekends, and days off into the calendar, FastTrack produces accurate estimates of the time needed to complete activities.

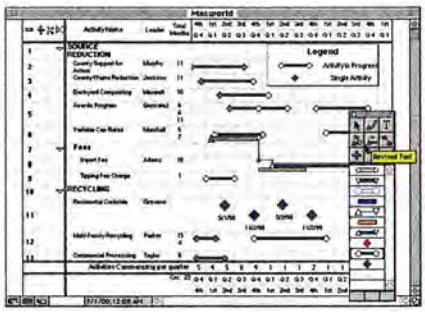
To accommodate the inevitable changes, you can use a link tool to draw dependencies among tasks—that is, when one task is delayed or finishes early, FastTrack automatically reschedules the succeeding tasks. To keep track of revisions, you simply turn on the option that displays three date bars per activity: scheduled, revised, and actual.

Where mainstream project managers—such as Scitor's Project Scheduler (see *Reviews*, August 1993) and Microsoft Project (see *Reviews*, January 1993)—have predefined functions for calculating expenses and other performance factors, FastTrack requires a bit more effort. For example, new math functions give you the total cost of an activity, but you have to type in a formula that multiplies the task's actual duration by the daily rate to get that number. Similarly, to track costs per week and keep a running total of all costs, you have to create time-period summaries (which appear at the bottom of a column). However, FastTrack makes it easy to create custom layouts, insert graphics and text blocks in the chart area, and design legends. For instance, the Legend Builder displays all the bar styles used in a chart and then helps you label them.

FastTrack Schedule produces high-quality printed output and offers a variety of resizing options, ranging from a single sheet of paper to a wall-size display. You can save plans as JPEG, GIF, or TIFF graphics and export tabular data as HTML tables; unfortunately, the Mac version doesn't let you embed launchable URLs or e-mail addresses.

Macworld's Buying Advice

Unless you need to schedule resources or perform complex budget analysis—tasks better left to Project Scheduler or Microsoft Project—FastTrack Schedule 5.0 will help you produce high-quality schedule charts quickly. With its new budgeting and Internet functions, FastTrack Schedule is a good value (and a bargain if you run it over a network—you buy licenses only for the number of concurrent users you anticipate). More-complete project-management programs are available, but none are better at creating and updating schedule charts.—MIKE HECK



Graphical Scheduling FastTrack Schedule makes creating tasks, indicating their duration, and linking activities a simple click-and-drag process. Version 5.0 also adds custom calculations for tracking budgets.

RATING: ★★★★/7.9 **PROS:** Creates HTML files you can place on a Web server; summarizes budget data; custom calculation fields; easy data entry and graphing. **CONS:** No resource management; formulas need to be entered manually. **COMPANY:** AEC Software (703/450-1980, www.aecsoft.com). **LIST PRICE:** $299; network pricing available.

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CyberStudio 2

STILL THE BEST WEB-SITE EDITOR

ALTHOUGH LESS THAN A YEAR old, GoLive CyberStudio has earned a solid reputation as one of the top Web-site editors on the market (see *Reviews*, July 1997). The just-released CyberStudio 2, a free upgrade, adds several new features while addressing most of the debut version's shortcomings.

The most welcome addition is a WYSIWYG preview of frame sets. You can now drag and drop files and URLs directly into frames instead of fumbling with dialog boxes, and you can rearrange frame sets by dragging the panes. The Inspector window now displays thumbnail previews of HTML pages and images; in the Project window, two new tabs let you create and save groups of colors and font sets associated with a project.

The new Favorites tab in the Palette window lets you store boilerplate images, layouts, and other page elements. A feature introduced in CyberStudio 1.1 lets you save page layouts as a stationery pad on the Mac desktop and then reuse them as Web-page templates with the New From Stationery command in the File menu. Also new in version 2 are a graphical front end for Apple's WebObjects Enterprise site-development program and support for Microsoft's Marquee tag and ActiveX controls.

Enhancements to the program's layout grid let you add a background color and control the vertical alignment of text boxes on a grid, and new keyboard and mouse shortcuts make HTML tables easier to edit. A terrific new feature is the automatic highlighting of bad links right on a page, so you can tell immediately which links need to be fixed (see "Nail Those Bugs").

GoLive has improved CyberStudio's built-in FTP upload capability, adding the ability to publish to multiple servers (useful for larger distributed sites). Version 2 also allows finer control over which pages and page elements are published and which aren't. Besides adding features, GoLive has enhanced CyberStudio's speed under Mac OS 8: opening and scrolling pages are faster than in version 1.1, as is importing existing sites into new projects.

Still, some earlier problems remain in this version. While the JavaScript syntax checking is better, it still misses some common mistakes and doesn't support JavaScript 1.2. And although GoLive added a spelling checker that can inspect either a single page or an entire site, you can't add words to its user dictionary (although the help text in the spelling checker's dialog box states that option is available); it also incorrectly flags JavaScript as spelling errors instead of ignoring any text within a **<SCRIPT>** tag. GoLive says a maintenance release will add JavaScript 1.2 support and fix the problems with the spelling checker. CyberStudio also lacks support for Cascading Style Sheets—although, to be fair, no other Mac program supports them either. Finally, the Apple Guide file is neither extensive nor especially helpful, and the thick manual needs a more detailed index.



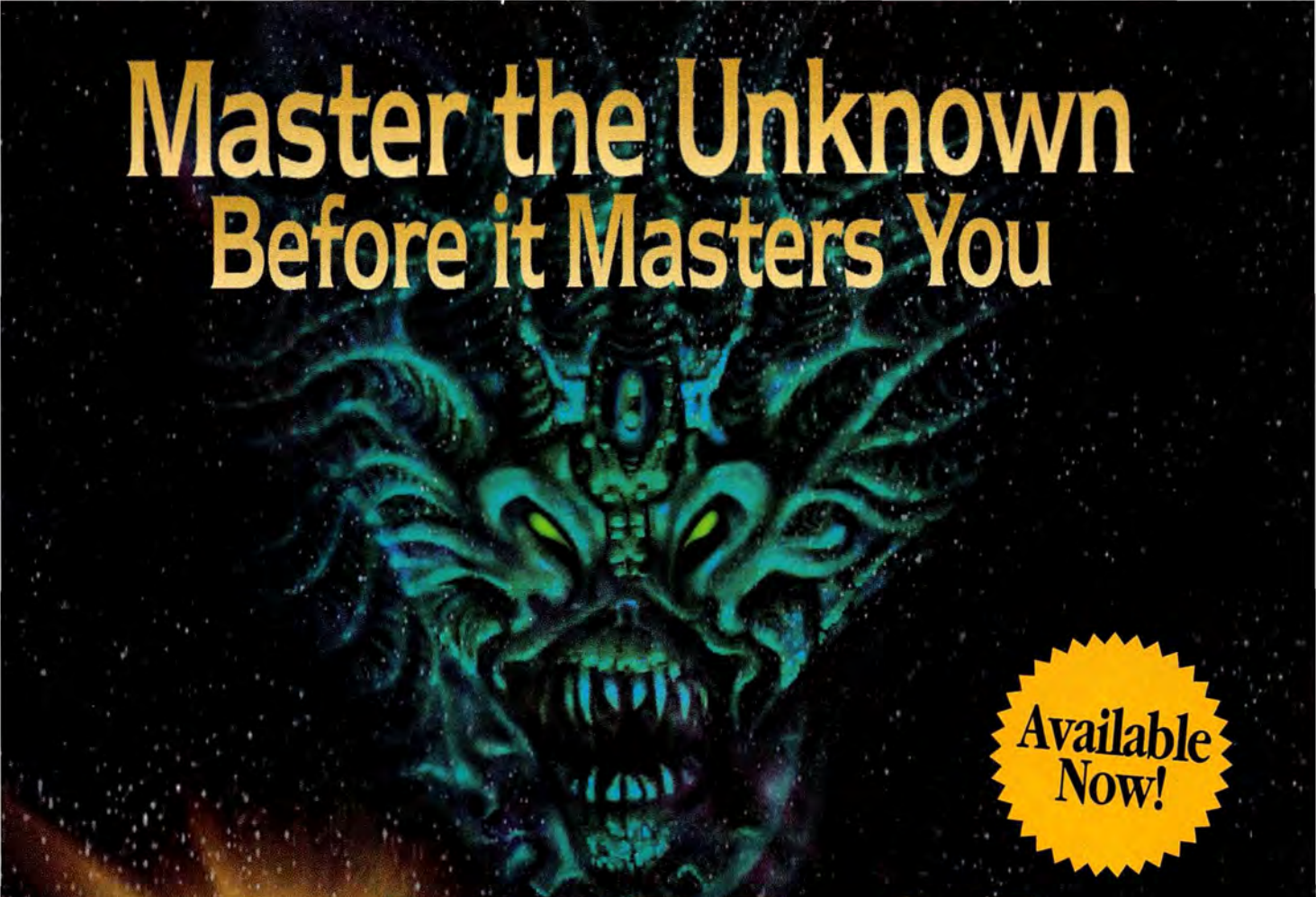
Nail Those Bugs Tracking down bad links is easy in CyberStudio 2: the program highlights them for you in layout mode and in the Link Inspector window.

Macworld's Buying Advice

With this second major release coming only five months after the initial version, GoLive seems determined to keep CyberStudio at the forefront of Web-site editors; the company has already announced its intention to produce a version of CyberStudio for Rhapsody. For now, CyberStudio remains the premier tool for creating Web sites on the Mac.—TOM NEGRINO

RATING: ★★★★/8.6 **PROS:** New WYSIWYG frame preview; visual feedback on bad links; better publishing control. **CONS:** JavaScript editing still needs work; spelling checker can't save user entries; no support for Cascading Style Sheets. **COMPANY:** GoLive Systems (650/463-1580, www.golive.com). **LIST PRICE:** $349.

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SiteCam

CREATE WEB-CAM IMAGES AND TIME-LAPSE MOVIES

GIVEN THAT WEB SURFERS ARE a voyeuristic lot, what better way to lure them to your site than with a Web cam? Connect a video camera to your Mac, point it at something interesting (or not), and snap a fresh image at regular intervals; then watch the visitors come by for a look. But whether your Web cam will be a novelty (scenic-view cams, fish-tank cams, rotting-slab-of-Spam cams) or will serve a more practical purpose, such as security, you'll need a way to get the images onto your site. One answer is to use Rearden Technology's SiteCam 1.0.1, the commercial successor to the shareware MacWebCam. With SiteCam, you can set up a Web cam in a matter of minutes and then start snapping images at regular intervals, creating time-lapse movies or even serving up live video.

You use the Settings command to specify the interval between images, the images' dimensions and file formats, and other details. Generally, you save images in a specific folder on your Web server, and the server dishes out the appropriate images each time someone visits your Web-cam page. You can stamp images with the date and time and with caption text, such as your site's URL (see "PoochCam"); you can also specify that SiteCam combine a series of images into a QuickTime movie—to create a time-lapse movie showing clouds racing across the sky, perhaps, or mold spreading across that slab of Spam. You can even provide several views of your Web-cam scene—for example, a small image for slow modems and a larger one for faster connections.



PoochCam SiteCam lets you create up to four captions and add a background element, such as the drop shadow shown in the preview window at right.

Although SiteCam works best if you have your own Web server and a dedicated Internet connection, you can also create a Web cam by using a dial-up connection. SiteCam includes an AppleScript that transfers an image to a Web server via FTP, even dialing and disconnecting before and after the transfer.

SiteCam's live-video feature relies on a WebStar-format plug-in to feed a continuous video stream to the server. Because live video could choke a busy Web site's connection and server, SiteCam allows you to specify an upper limit on simultaneous connections (you can also turn off live video entirely).

Macworld's Buying Advice SiteCam's interface has a few rough edges—for example, I'd like to see the seven option screens that make up the Settings command divided into separate commands. And the documentation, supplied in HTML format only, is a bit lean. But SiteCam's capabilities outweigh these minor drawbacks; it offers a great way to attract voyeurs and visitors alike to your Web site.—JIM HEID

RATING: ★★★★/7.8 **PROS:** Straightforward and powerful; excellent captioning features. **CONS:** Some rough interface edges; lean documentation. **COMPANY:** Rearden Technology (415/550-7573, www.rearden.com). **LIST PRICE:** $129.

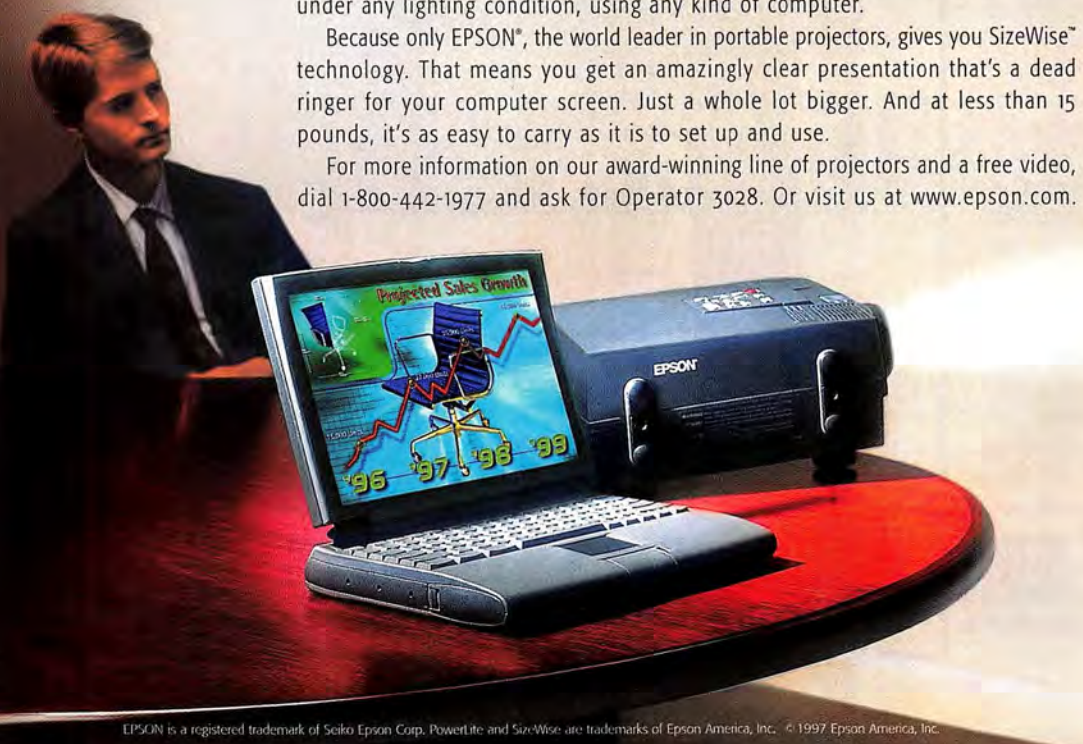
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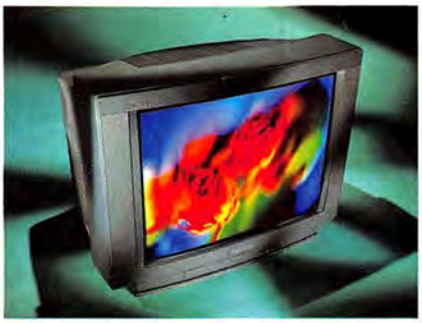
Arcadia AR2.7AV

BIGGER ISN'T ALWAYS BETTER

THE ARCADIA AR2.7AV COMBINES the circuitry of a TV with that of a computer display, giving you a hybrid monitor that accepts input from either a Macintosh or a PC. The monitor includes composite-video and S-Video inputs, which allow you to directly connect to a TV-tuner card in your Mac and to video devices such as a VCR, DVD player, or Super VHS camcorder. The first thing you'll notice is its size; it's a 29-inch monitor with a 27-inch viewable area. But if you want decent resolution for your Mac display, you'll want to look elsewhere—the big screen doesn't effectively support higher resolutions.

The monitor supports resolutions up to 800 by 600 pixels at a 60Hz vertical refresh rate—well below the recommended VESA standard of 75Hz. The resulting flicker makes the Arcadia inadequate as a desktop display for a Mac unless the monitor is operated at a lower resolution. That said, the Arcadia still holds its own for TV or video playback.

The brightness and color fidelity of the video playback—from a variety of sources—were impressive. The monitor comes with a seven-button remote with TV-style controls.



ARNOLD TIOSEJO

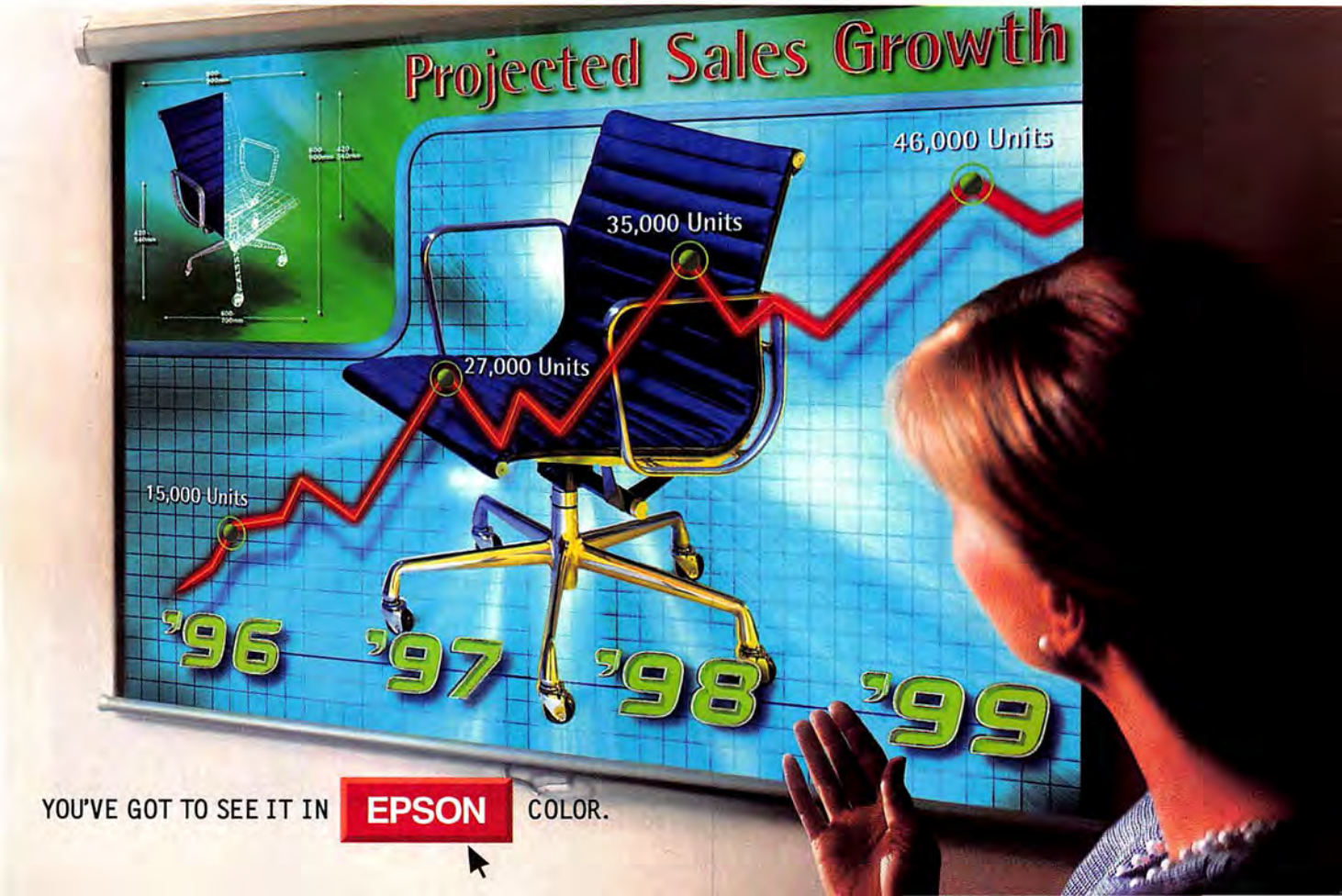
However, when using the manual control buttons on the monitor itself, pressing the volume-down button resulted in the monitor's powering off. Princeton Graphics said the problem was unique to *Macworld*'s test unit, but this could not be verified at press time.

Despite the versatility of input sources and the remote control, the Arcadia's features are lacking. The monitor doesn't automatically detect the input source at start-up. It comes configured to expect a computer connection by default. If you plug the monitor into a VCR only, you have to scroll through menus and manually select the correct video source before viewing an image.

Princeton Graphics covers the monitor with a one-year warranty on parts, labor, and defects in the CRT. That's a little skimpy compared to most monitors, but par for the course for most TVs. If 27 inches isn't big enough for you, a 33-inch model is available for $1,399. Additionally, non-AV models lacking composite-video and S-Video inputs are available for $200 less. The integrated stereo speakers are still included.

Macworld's Buying Advice Although the Arcadia AR2.7AV brings large-screen-TV capability to a computer display for a relatively low cost, there's not much point in getting one if you already own either a TV or a monitor—regardless of size. You can use the Arcadia as your primary Mac display, but you'll have to set the resolution to 640 by 480 pixels to achieve a 75Hz refresh rate—and 12-point type will end up looking like 48-point. If you're looking to upgrade your TV set, you won't be pleased either, since there's no TV tuner built in. If you need to use your Mac with a big screen at a higher resolution, you're better off shopping around for a more expensive display that supports higher refresh rates.—SUSAN SILVIUS

RATING: ★★/5.0 **PROS:** Very easy to set up and use; moderate price. **CONS:** Flickers at high resolution; doesn't detect video source automatically; no built-in TV tuner. **COMPANY:** Princeton Graphics Systems (714/751-8405, www.prgr.com). **LIST PRICE:** $999.



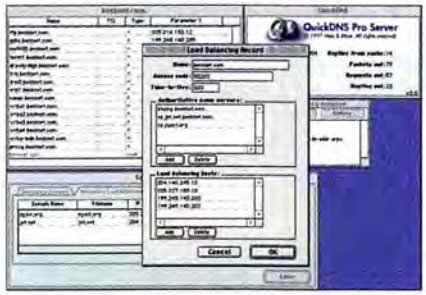
QuickDNS Pro 2.0

MAJOR-LEAGUE WEB SERVING

WEB SERVING IS BIG BUSINESS. To be a player, a Web server must be beefy enough to handle millions of hits a day and robust enough to stay up when disk drives, servers, and network connections die. The key is having a sophisticated Domain Name System (DNS)—the facility that translates a name such as www.home-run.com to an Internet address such as 205.227.180.10. Until recently, Mac-based Web shops had to use Unix DNS servers to provide redundancy and reliability. Men & Mice's QuickDNS Pro 2.0 lets big-league servers get DNS performance and reliability on a Mac.

QuickDNS Pro installs quickly and easily; its electronic manual and online help are top-notch. If you're already running a DNS on a Unix or Windows system, you can use QuickDNS Pro to import your existing files and be up and running in minutes.

QuickDNS Pro puts a friendly Mac interface on the traditionally tedious, text-file–based DNS-configuration process. In addition to providing a graphical interface for editing DNS records, various domain-setup assistants help you with such common DNS chores as adding a server or creating a subdomain. These assistants make it nearly impossible to construct improper DNS records, heading off the most common problem novice DNS administrators face.



Balancing Act QuickDNS Pro can distribute Web traffic among several WebStar servers.

The product supports secondary backup DNS serving and dynamic load balancing, which routes traffic to multiple identical StarNine WebStar (or compatible) servers based on their workload. The load-balancing feature can also detect when a Web server goes down and route incoming requests to other servers until the failing server recovers; the only downside is that you must buy multiple copies of QuickDNS Pro to run offsite DNS servers.

Going beyond the basics of Web serving, QuickDNS offers a useful print feature for generating nicely formatted reports of DNS files, AppleScripts for exporting DNS files to Unix and creating reverse-DNS files, and a load-balancing test application.

When compared with Apple's MacDNS (part of Apple Internet Server Solution) and the freeware NonSequitur, QuickDNS Pro delivered 50 times as many cached and non-cached responses per minute. It does have two inconveniences that complicate debugging: It can't display the contents of the secondary domains it's serving, and it doesn't display error messages in real time—you must constantly close and reopen the log file with a text editor.

Macworld's Buying Advice If not for the need to buy multiple copies for offsite load balancing and redundancy, QuickDNS Pro would be a must-have. If you're looking for an all-Macintosh DNS product ready for world-class Web serving, however, QuickDNS Pro is the one.—MEL BECKMAN

RATING: ★★★★/7.6 **PROS:** Domain-setup assistants; secondary server support; dynamic load balancing; redundant Web-server routing. **CONS:** Can't display secondary records; no real-time error-message display. **COMPANY:** Men & Mice (603/645-4564, www.menandmice.com). **LIST PRICE:** $290.

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S900i/250 SPECIFICATIONS:

MODEL NAME	S900i/250
Processor Type	604e/250MHz
RAM	64MB up to 1GB
Interleaved Memory	Yes
Access Memory	128-bit
Level-2 Cache	512K
CD-ROM Speed	24X SCSI
Hard Drive	4GB Ultra SCSI
Drive Bays	7 total/2 open
Total PCI Slots	6
Video Memory	4MB
ADB Ports	2
Ethernet	Yes
10Base-T & 100Base-T	Yes
Ultra-Wide SCSI Card	Yes
Serial Ports	2
Zip Drive	Yes
Mac OS 8	Yes
Global Village	External 33.6 fax/ modem/speakerphone

Monitor not included. Features subject to change without notice.

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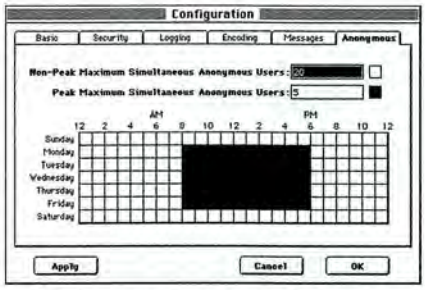
Rumpus Pro 1.1

FLEXIBLE FTP SERVER SOFTWARE

ALTHOUGH WEB SERVERS GET all the glory, FTP servers still do the heavy lifting. The most common scheme for transferring files over the Internet, FTP (File Transfer Protocol) provides access to software libraries and large document collections and lets Web publishers upload content to Internet service providers. Maxum's Rumpus Pro 1.1 is the latest entry into the relatively uncrowded field of FTP server software, whose biggest player is Stairways Shareware's NetPresenz (see *Reviews*, May 1996). Not only does Rumpus Pro allow more flexible setup and security than the competition, but it also offers some unique performance-tuning features.

Rumpus Pro is a cinch to install and start: drag its files to your server's hard disk and double-click on an icon, and you've got an FTP server. Rumpus Pro supports up to 256 simultaneous users; if your FTP-serving needs are lighter, consider the $195 Rumpus 1.1, which supports up to 32 simultaneous users but is otherwise identical.

Rumpus Pro is set up to allow anonymous FTP access—anyone can log in and retrieve (but not upload) files. That's ideal for public download areas, but for internal or service-provider use, you'll need Rumpus Pro's access-control and security features. If you're running a busy FTP site that hosts both anonymous and registered users, you can restrict anonymous access during peak traffic periods to give registered users first dibs (see "Peak Performance").



Peak Performance Here, Rumpus Pro is configured to allow up to 20 simultaneous anonymous users during nonpeak hours, but only 5 such users during business weekdays.

Most FTP servers rely on the Mac OS's file-sharing features and its Users & Groups control panel to specify which folders are available for FTP access, who is able to access them, and whether those users can modify folders or simply access their contents. Rumpus Pro supports this scheme, but its internal user database also lets you define users and access privileges without having to activate file sharing. Since activating file sharing opens security holes and is a surefire way to slow any Mac, the result is better security and better performance.

Rumpus Pro has several noteworthy performance-management features to avoid bogging down your Macintosh. A slider lets you tweak Rumpus's performance based on how you're using the program and the Mac it's running on. Set the slider to Faster FTP if you're creating a dedicated FTP server, and Rumpus will all but monopolize the Mac; if you're running other programs, such as HTTP or e-mail server software, bump the slider closer to the Better Behaved setting.

Macworld's Buying Advice Attention to detail is a rare commodity in FTP server software, and it's what makes Rumpus Pro 1.1 the best choice for anyone who wants to set up a full-featured FTP site.—JIM HEID

RATING: ★★★★/8.0 **PROS:** Excellent performance and performance-tuning features; doesn't require Mac OS file sharing. **CONS:** Manual lacks index. **COMPANY:** Maxum Development (630/830-1113, www.maxum.com). **LIST PRICE:** $395.



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C600x/240 SPECIFICATIONS:

MODEL NAME	C600x/240
Processor Type	603e/240MHz
RAM	32MB
In-Line L2 Cache	1MB
CD-ROM Speed	12X
Hard Drive	3GB
Processor Bus Speed	80MHz
Video Memory	1MB
33.6 Fax/Modem	Included
External Speakers	Included
Jabra Microphone	Included
10 Base-T Ethernet	Yes

Monitor not included. Features subject to change without notice.

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* Performance statistics based on comparison to C600 without CacheDoubler. The C-series CacheDoubler upgrade card for installed base will be available in September '97.

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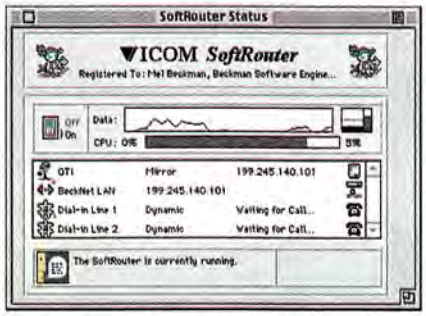
SoftRouter 4.0

INEXPENSIVE ALTERNATIVE TO HARDWARE ROUTERS

THE MAC OS LAGS BEHIND WINDOWS when it comes to TCP/IP routing and remote access; Apple Internet Router and Apple Remote Access can't hold a candle to Windows NT's Remote Access Service and built-in IP routing. Vicom's SoftRouter 4.0.4 helps level the playing field, giving the Mac TCP/IP-routing capabilities equal to and even surpassing those of Windows NT for about half the price of a hardware router.

SoftRouter has the user-friendly interface of its predecessor, Internet Gateway 3.7 (see *Reviews*, July 1997). But while Internet Gateway is geared specifically to Internet connections, SoftRouter is aimed at general-purpose internetworking. It does the work of dedicated hardware routers costing thousands of dollars, letting you connect multiple Ethernet, Token Ring, dial-up, and wide-area networks to a single Mac and route traffic among them.

The software has all the tools you need for building a world-class network: Dynamic Host Configuration Protocol (DHCP), host-access rights, RADIUS (Remote Authentication Dial-In User Service) authentication, unlimited PPP dial-in ports, and TCP/IP multihoming. DHCP simplifies IP-address management by assigning the addresses automatically to both Mac OS and Windows users; host-access rights let you control which sites a given user can reach. These features, combined with support for any number of Ethernet, Token Ring, and serial dial-in ports, let you build a wide-area network capable of handling thousands of users. And Webmasters will love SoftRouter's true IP multihoming, which lets them run multiple Web servers on one machine.



The Easy Route Vicom's SoftRouter 4.0 is a friendly alternative to dedicated hardware routers.

As powerful as these features are, SoftRouter's user interface ensures they don't get in your way if you don't need them. I set up a Performa 6400/200 for two-user dial-in ISDN access in minutes, using the Mac's Users & Groups list for password authentication; the Windows and Mac OS users connected on first try. The same machine routed traffic between my LAN and T1 Internet connection at full speed and used less than 15 percent of the processor, according to SoftRouter's CPU gauge.

All that's missing is IP-address translation, which gives multiple users Internet access via a single IP address. Because Internet Gateway charged by the user for this feature, it was quickly priced out of the market; many hardware routers now have unlimited IP-address translation built in.

Macworld's Buying Advice Wide-area networks traditionally require a slew of hardware routers and hefty consultants' fees to make them work. With SoftRouter 4.0.4, Vicom has ushered in an era of user-friendly, do-it-yourself routing.—MEL BECKMAN

RATING: ★★★★/8.1 **PROS:** Unlimited ports; dynamic PPP remote access; RADIUS authentication; virtual Web serving. **CONS:** No IP-address translation. **COMPANY:** Vicom Technology (415/691-9520, www.vicomtech.com). **LIST PRICE:** $199.

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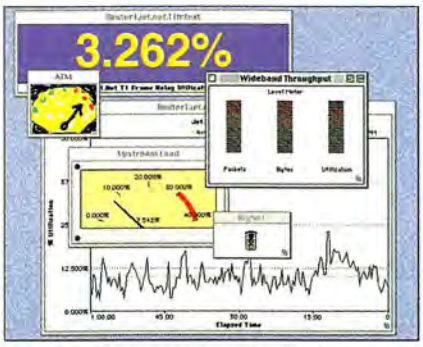
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NetMeter 2.0

NETWORK MONITORING FOR THE MASSES

MORE ORGANIZATIONS THAN ever are getting dedicated Internet connections, sending the demand for low-cost performance-monitoring utilities through the roof. The AG Group's NetMeter 2.0 lets users take their networks' pulse without becoming network engineers. Although the new version lacks features found in competitors, it offers a more straightforward user interface, a lower price, and support for the Simple Network Management Protocol. SNMP lets NetMeter measure traffic flow in almost any intelligent network device—an Internet router, Ethernet hub, or server—from anywhere on the Internet.

NetMeter's new intelligent assistant prompts you for the device address, interface name and speed, type of data to be measured, and type of meter. The meters are not only the heart and soul of the program but they also make network monitoring fun (see "Picture Perfect"). Six visual meter formats (needle, graph, level, text, traffic light, and QuickTime movie) and three audio formats (music, canned phrase, and speech) let you build a dashboard that reports the status of any network device.



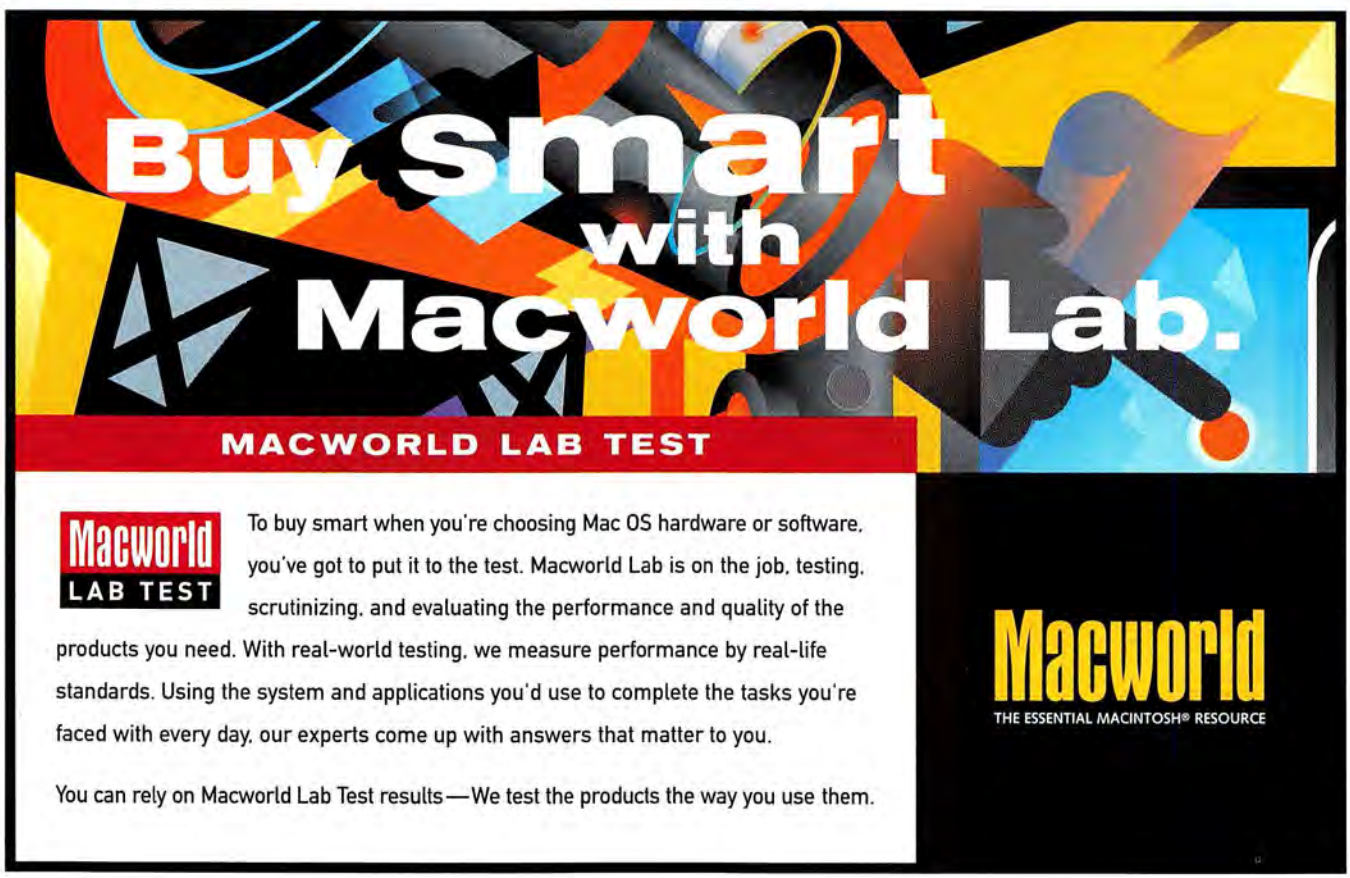
Picture Perfect NetMeter 2.0 puts a face—and a voice—on dry network-management statistics.

New in this version are an export meter, which saves measurement data to a text file for offline analysis, and the ability to save meters as JPEG or PICT files for live publication on the Web. The new release also lets you resize most meters to make them more visible on screen from across the room. And NetMeter 2.0 can work with AG's Satellite data-collection software agent for advanced snooping, although the program is no longer bundled with Satellite.

Alas, NetMeter still lags behind its competitor, Neon Software's lower-priced CyberGauge 2.0 (see *Reviews*, September 1997). In addition to being more difficult to use, NetMeter still doesn't let you label or enlarge traffic lights—a flaw noted in our review of NetMeter 1.0 (see *Reviews*, June 1996). Although you can write an AppleScript to save a meter's image as a graphic at regular intervals (such as for posting on a Web site), this feature should really be built-in. The documentation contains no tips on monitoring popular network devices, such as those from Ascend and Cisco. And NetMeter can't bond multiple channels so that they can be monitored as a unit—something you'd want to do with ISDN routers, for example.

Macworld's Buying Advice Although no longer the least expensive or most capable low-end network monitor, NetMeter is inarguably the most fun. If you need a general-purpose utility and price is not a determining factor, NetMeter 2.0 is worth adding to your tool kit.—MEL BECKMAN

RATING: ★★★/6.7 **PROS:** Variety of meter presentations; data-collection and graphic-export capabilities; integrated with Satellite for remote monitoring. **CONS:** Expensive; still can't resize or label some meters; no channel bonding; no vendor-specific SNMP documentation. **COMPANY:** The AG Group (510/937-7900, www.aggroup.com). **LIST PRICE:** $295.



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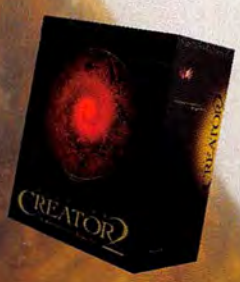
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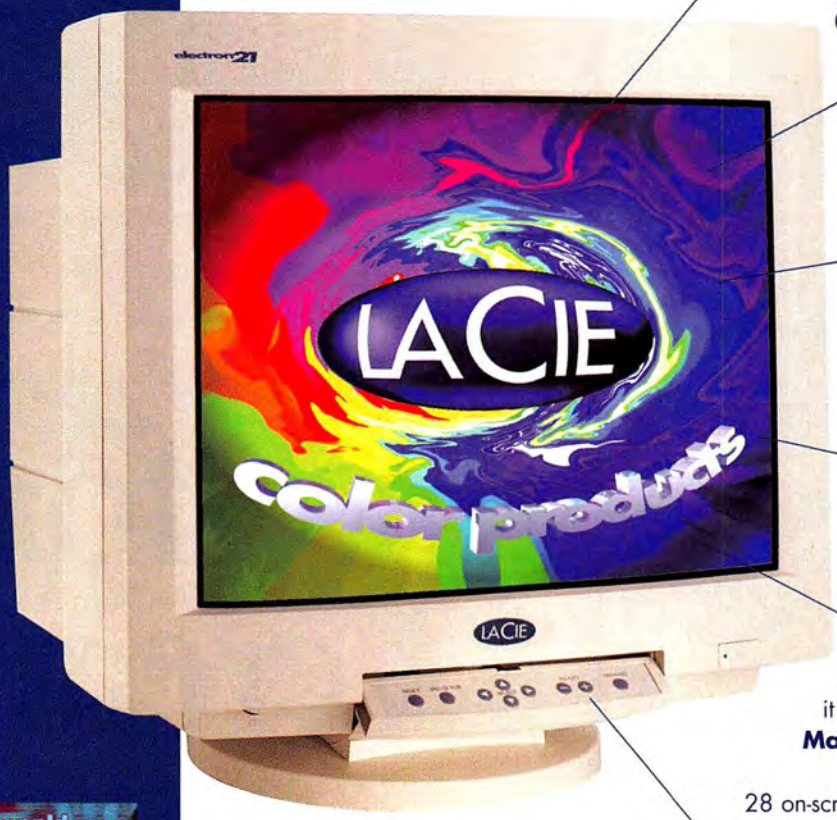
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by Galen Gruman

QuarkXPress versus PageMaker

The battle intensifies: Which is right for you?

PAGEMAKER LAUNCHED THE DESKTOP-PUBLISHING REVOLUTION ONE YEAR BEFORE QUARKXPRESS HIT THE SHELF, BUT EVER SINCE, THE TWO HAVE BATTLED FIERCELY TO BE THE MARKET'S BEST. QUARKXPRESS CEMENTED ITS POSITION AS THE POWER USER'S PROGRAM OF CHOICE IN THE EARLY 1990S, BUT IT'S BEEN STALLED AT VERSION 3.3 SINCE 1993, WHILE QUARK HAS UNSUCCESSFULLY ATTEMPTED TO ENTER NEW MARKETS.

Meanwhile, PageMaker has forged ahead. Adobe Systems acquired the application from Aldus and delivered two new versions, 6.0 and 6.5, that expanded the program's features far into QuarkXPress's high-end territory, particularly in the areas of color creation, typographic precision, and layout controls.

Now, Quark is about to launch a new offensive with version 4, which is expected to ship soon (Quark won't provide a date, but I estimate it'll be available in November). After a four-year wait, many people are ready to buy QuarkXPress 4 as soon as it ships, which is why *Macworld* decided not to wait until its official delivery date to compare it to PageMaker.

Should you upgrade or switch to QuarkXPress 4 or stay with or switch to Adobe PageMaker 6.5? The short answer is that most people should choose QuarkXPress 4 ($995; 303/894-8888, www.quark.com). PageMaker 6.5 ($895; 408/536-6000, www.adobe.com) was a worthy competitor to QuarkXPress 3.3, but version 4 tips the scales firmly in QuarkXPress's favor, as the table "Who Wins Where: QuarkXPress 4 versus PageMaker 6.5" shows. Read on to see why.

The Key Layout Advantage

PageMaker started out mimicking the manual paste-up approach used in the days of waxed galleys and X-acto knives, when rulers and a fine eye helped you position images and text. That made the transition to computer-based publishing easier in the mid-1980s, but in today's

JENNIFER JESSEE

electronic age, this anachronistic approach slows many users down.

The manual approach limits PageMaker's—and your—flexibility and efficiency, causing you to tweak and fiddle with even straightforward layouts. For example, PageMaker makes you use labor-intensive approaches even for such basic tasks as changing the number of columns on a page and flowing text through a layout. With complex layouts, this work can be overwhelming. Ditto for when you're on a tight deadline and need to change your layout fast.

On the other hand, not only is QuarkXPress strong in the area of sophisticated layout—where text wraps, the tight integration of text and graphics, and imaginative use of typography come into play—but it also lets you customize your layouts while maintaining consistent standards. For instance, template documents, instead of being straitjackets, help you efficiently predefine your standard layout settings and can seriously save you time.

Column Controls In QuarkXPress, you change the number of columns on a page by entering a new column value in the Measurements palette—voilà, QuarkXPress reflows your text for you. In PageMaker, you must manually add or remove columns and reflow the text.

Text Wrap QuarkXPress's text wrap can't be beat. In version 4, the program adds the ability to create a Bézier text or picture box of any shape, and the program will flow text around any box's contours. Plus, the application now can automatically wrap text around clipping paths and alpha channels in imported images. In PageMaker, you have to create the text-wrap shape manually.

Text Alignment QuarkXPress likewise lets you control how text aligns on a page. You can set vertical justification, in which interparagraph and/or interline spacing is stretched to fill the column depth. You can ensure that text aligns to the baseline grid, which keeps text aligned from column to column automatically. PageMaker can't perform vertical justifications, and its workaround for aligning text to a baseline grid is frankly too much effort (setting Snap to Rulers, matching the ruler's measurements to body-text leading, and then using Align Next Paragraph to Baseline in your style sheets).

Reusable Settings Once you perfect a QuarkXPress document, you can reuse its settings with new text and graphics while still being able to modify the new layout. In PageMaker, you practically have to start from scratch. You can ease some of this work with PageMaker's master pages, which help set up a basic layout. However, not only do QuarkXPress's master pages offer similar capabilities but QuarkXPress also surpasses PageMaker by making each layout element—whether it's on a master page, from a library, or in a template document—easy to alter.

Layers PageMaker's one decided layout advantage over QuarkXPress is the use of layers, which lets you create multiple documents in one. Because you can selectively turn layers on and off, you can create multilingual documents (each language's text on its own layer), add production notes (again on their own layer), or speed printing by having graphics on a separate layer (and hiding it when printing early rough proofs).

Scripting Support If you need to automate and simplify your layout process—for instance, by automatically inserting information from a Claris FileMaker database into your layout—there's no substitute for the strong integration QuarkXPress shares with AppleScript. This advantage continues.

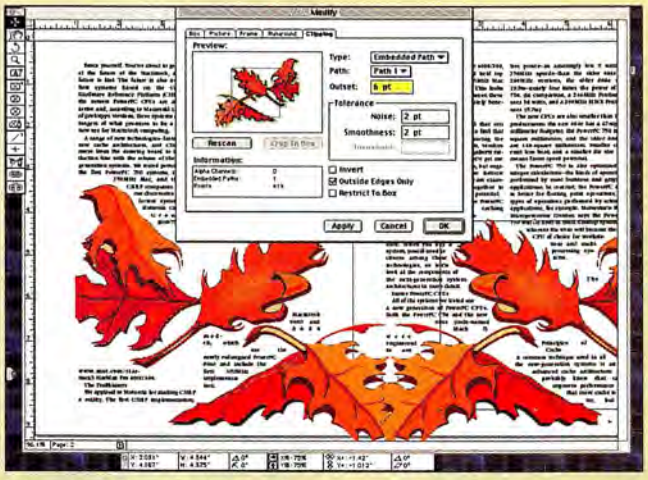
The Graphics and Color Competition

Images add sizzle to a layout, and today the trend in design is to push the use of images to the limit. With its new graphics tools, QuarkXPress 4 increases designers' artistic possibilities.

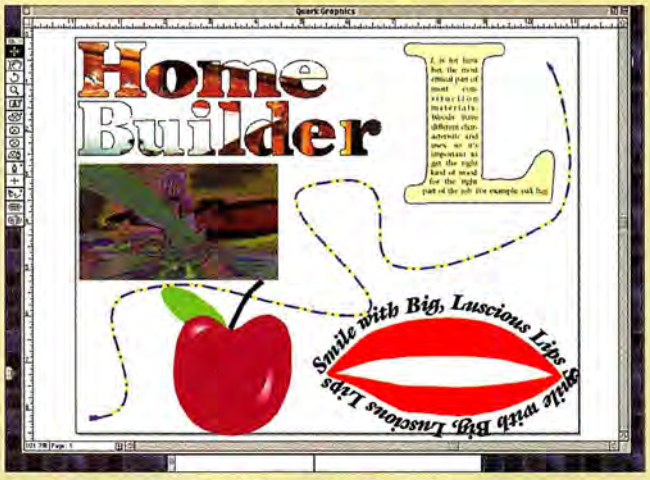
Illustration Tools In QuarkXPress 4, you can create text and picture boxes from smooth-lined Bézier curves, place text on a path, and create your own graphics. While these tools are no substitute for Adobe Illustrator or Macromedia FreeHand, they are a powerful and efficient alternative if you need to create simple and mildly complex graphics. PageMaker has no equivalent functions.

Box Controls QuarkXPress 4 adds the ability to convert text into picture and text boxes, plus the ability to merge multiple boxes. PageMaker has no equivalent.

Clipping Paths QuarkXPress 4 lets you create complex clipping paths directly in QuarkXPress without having to turn



Interactive Wrap QuarkXPress 4's new wrap features allow you to wrap text around an image's clipping path, even if the image or its path extends outside the picture box.



Graphics Integration QuarkXPress 4 adds a host of Bézier tools for boxes, lines, and text paths, letting you create all sorts of illustrations without leaving the program. It also lets you manipulate the color balance of bitmap images. Plus, you can convert text to boxes.

to Adobe Photoshop. These clipping paths, as well as those of imported EPS and TIFF files, are completely editable. PageMaker has no equivalent feature.

Lines and Dashes QuarkXPress lets you create your own lines and dashes with which to frame boxes (PageMaker lets you choose only from a palette of predefined lines and dashes whose thickness you can change) and offers arrowheads for lines (PageMaker doesn't).

Halftoning and Color Balance For halftoning and color balance, QuarkXPress is superior due to its broader controls for adjusting color output. However, most people don't radically alter the color balance of images imported into their page-layout programs, relying instead on Photoshop for such work.

Graphics Import PageMaker decisively bests QuarkXPress at importing graphics. PageMaker supports many more key file formats than QuarkXPress, a laggard in file-import support for years. Import formats unique to PageMaker include AutoCAD DXF, CGM, CorelDraw, and QuickTime movies.

Bitmap Controls PageMaker also fares better than QuarkXPress with image manipulation, thanks to its ability to apply Photoshop filters to bitmap images. It's ironic that QuarkXPress's designers ignored this capability, given their new emphasis on graphics creation.

Color Management Both programs offer solid color-creation features and use the same Kodak color-management engine. QuarkXPress has a slight edge because it lets you mix color models with its new multi-ink color feature.

Tight Battle in Typography

Typography may not be as viscerally appealing as graphics, but it's a key part of effective layout and design. For years, QuarkXPress outclassed PageMaker in this area, but first Aldus and then Adobe gradually enhanced PageMaker's typographic controls. QuarkXPress continues to lead in this area; however, PageMaker has narrowed the gap greatly.

Character Typography For most typographic tasks, the two programs are equal. Both give you powerful control over kerning and tracking as well as leading and paragraph spacing. Both give you fine control over subscripts and superscripts (although PageMaker gives you paragraph-by-paragraph control, compared with QuarkXPress's more restrictive documentwide settings). QuarkXPress supports a higher level of precision than PageMaker, although this precision is so fine that many people rarely notice the difference.

QuarkXPress continues to have one odd omission: no built-in em space. (There is a workaround: You can set the flex space, Quark's user-configured space character, to equal an em space, or you can use two en spaces.) An em space is perhaps the most common space after the regular space, and it makes no sense not to offer it as a standard character.

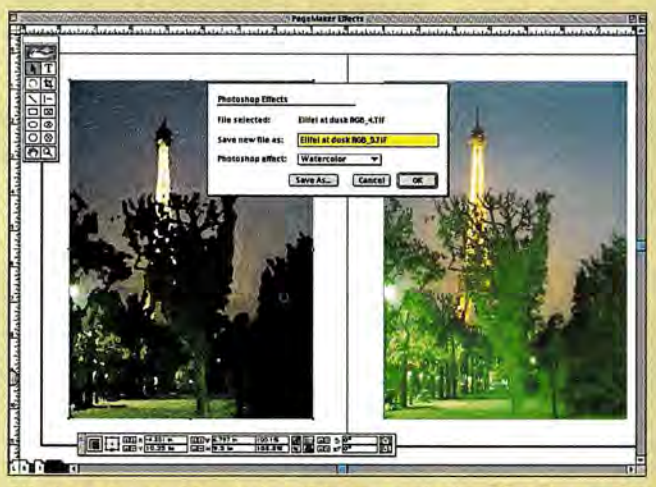
Layout Typography Still, QuarkXPress gets the nod for several features it has that PageMaker does not, such as vertical justification, built-in automatic dropcap creation, and the ability to lock text to the baseline grid.

Style Sheets QuarkXPress did the right thing by adding character-based style sheets to version 4. With these styles, you can apply formatting to selected text (such as the "Style Sheets" subhead that starts off this paragraph), not just to whole paragraphs. Why PageMaker 6.5 didn't add this feature is a mystery, given the strong user demand for it and the foreknowledge that QuarkXPress 4 planned to add it. While the interface for working with character and paragraph styles in QuarkXPress is still a bit rough, the inclusion of this vital feature is certainly welcome. For paragraph styles, the two programs are evenly matched.

Working with Text

Long ago, PageMaker added a basic text editor, which let users work on text in a separate window where they could adjust the text size and font to make it more readable without changing the actual text's attributes. QuarkXPress has never matched this advantage.

Text Editing PageMaker also offers more in terms of editing features. For example, PageMaker lets you search and replace text's color, tint, horizontal scale, leading, and tracking amount, while QuarkXPress does not. Although style sheets are usually where you set these functions, PageMaker does offer you control that QuarkXPress does not for text



Effects on Demand PageMaker 6.5 lets you apply Photoshop filters to TIFF files, giving you broad power to reinvent their look. The original image is on the right.



Automatic Alignment With its baseline-grid feature, QuarkXPress lets you ensure that text aligns properly.

styled independently of style sheets.

Text Import PageMaker provides better support for text import, supporting Microsoft Excel spreadsheets and HTML, which QuarkXPress does not.

Business Publishing Perks

For years, business-oriented features have been the province of Adobe FrameMaker and PC-based publishing applications such as Corel Ventura Publisher, but some of these features have crept into PageMaker and QuarkXPress in recent years. PageMaker first added its long-document and indexing features two years ago, and QuarkXPress 4 does so now. Unfortunately, table editing remains a weak spot for both.

Book Publishing Both programs offer similar approaches to long-document (or book) creation. Manuals, large reports, and traditional books are typically made up of files containing individual chapters, which you must group to maintain consistent style sheets and page numbers throughout. Neither program has a decided advantage in this area, and both programs' offerings are serviceable.

Indexing The two programs' indexing tools are comparable and fairly straightforward. Neither outclasses the other here in what is, in the end, tedious work.

Table Editing QuarkXPress and PageMaker tie for table editing only because they are both so bad at it.

PageMaker has had a separate table-editor utility for years, but it's not integrated with the program and requires that you export tables as graphics—making them uneditable in your layout and forcing you to reformat them and reexport them from the table editor if the layout's typography changes.

QuarkXPress has no table editor, although the company says it's working on a free plug-in to be distributed in a few months (no beta was available at press time). In the meantime, you have to use tabs, which is difficult and time-consuming, or plug-ins such as the $299 Tableworks Pro or the upcoming Entable 1.0, both from Tableworks (formerly known as Npath Software; 425/392-7745, www.tableworks.com).

I've never understood why neither program includes a quality table editor. The PC-only Ventura Publisher, now owned by Corel, has offered a great integrated table editor (and equation editor) for nearly a decade, which means both programs have a great model to copy.

Working with Others

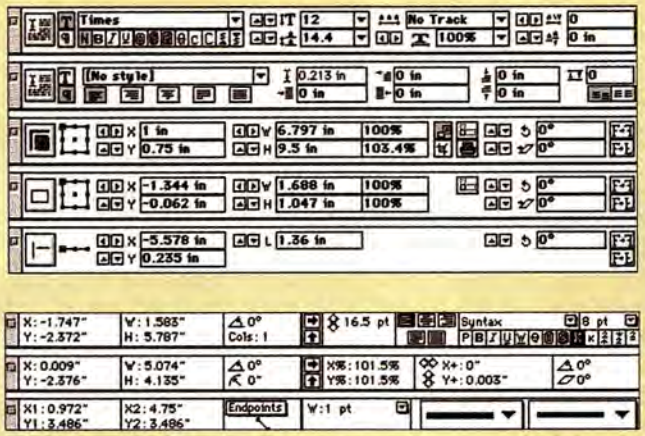
The purpose of publishing is to share information with others, whether they be readers, fellow designers and editors, or your service bureau.

Printing Both QuarkXPress and PageMaker support printer styles, which allow you to save output settings tailored to your document's needs and your printer's capabilities. Similarly, the two programs offer essentially the same controls over output.

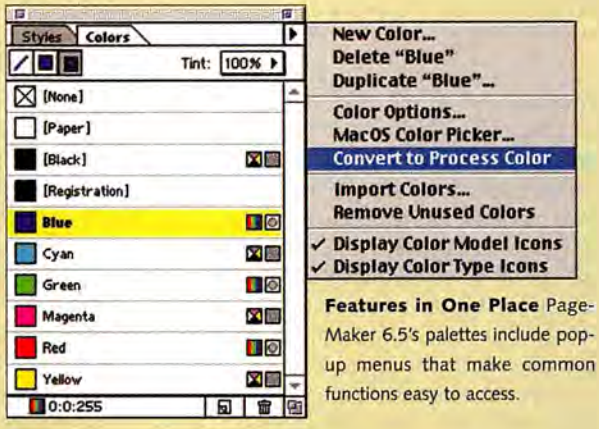
Service bureaus have said for years that PageMaker files tend to require more work and have more output errors than

Who Wins Where: QuarkXPress 4 versus PageMaker 6.5

Capability	Winner	Why
Basic layout	tie	Both applications make it easy to create basic pages and multiple columns, as well as add images.
Advanced layout	QuarkXPress	Superior text-flow, multicolumn-management, text-wrap, image-clipping, and margin controls make QuarkXPress the clear winner. Power users will appreciate QuarkXPress's tight integration with AppleScript.
File import	PageMaker	PageMaker supports many more key formats than QuarkXPress does— including Excel and HTML for text, and CorelDraw, AutoCAD DXF, CGM, and QuickTime movies for graphics. QuarkXPress is very much behind here.
Graphics creation	QuarkXPress	PageMaker simply doesn't approach QuarkXPress's ability to create sophisticated graphics, including Bézier curves and shapes, and to create picture and text boxes from fonts and merged shapes.
Image manipulation	PageMaker	Although QuarkXPress offers more controls over halftoning and color balance, PageMaker comes close in those areas *and* lets you apply Photoshop filters directly to bitmap images.
Typographic controls	QuarkXPress	QuarkXPress settings are more precise, and you can also set drop caps, paragraph positioning, and vertical justification. However, PageMaker gives you more control over some settings with paragraph styles.
Text editing	PageMaker	PageMaker's story editor is more usable than QuarkXPress's text-editing approach, and PageMaker can accomplish more text-editing tasks. Spelling checkers and hyphenation dictionaries are comparable.
Paragraph formatting	QuarkXPress	With character-based styles, built-in drop caps, and alignment to baseline grids, QuarkXPress outdoes PageMaker. But in terms of the basics, they tie.
Business publishing	tie	Indexing, table-of-contents creation, and other long-document features are comparable, while QuarkXPress's lack of a table editor is matched by PageMaker's all-but-unusable table editor.
Document management	tie	The ability to selectively append styles, colors, and more gives QuarkXPress the edge. PageMaker has better tools for preparing files for service bureaus.
Color handling	tie	QuarkXPress is slightly more flexible with color definitions and color models, but the two programs are essentially matched in their color capabilities.
Output handling	tie	The programs' print styles are comparable. However, most service bureaus report that output from earlier versions of QuarkXPress is more consistent and less prone to errors than that of PageMaker. We'll see if that remains true.
Network usage	neither	Both programs could—and should—make it easier to share preferences and manage source files among multiple users and workstations.
Web publishing	neither	PageMaker's HTML-export tools are awkwardly integrated, while QuarkXPress users must pay extra for a third-party add-on. PageMaker does provide excellent features for exporting to PDF.
Cross-platform support	tie	Both programs handle document exchange between the Mac OS and Windows well, provide nearly identical interfaces for the two operating systems, and minimize the platforms' fundamental differences.
Interface ease of use	tie	PageMaker's palette pop-ups and Control palette outshine QuarkXPress's equivalents, but QuarkXPress's overall organization is superior.
Extensibility	QuarkXPress	The hundreds of XTensions for QuarkXPress say it all. PageMaker's improved plug-in architecture still isn't as flexible as QuarkXPress's, and PageMaker has nowhere near the number of plug-ins available to QuarkXPress users.



The Best Palette PageMaker's Control palette (top)—a rip-off of QuarkXPress's original Measurements palette (bottom)—packs more features than QuarkXPress's, while still being easy to use. Note how the PageMaker version has more variants based on what is selected.



Features in One Place PageMaker 6.5's palettes include pop-up menus that make common functions easy to access.

do QuarkXPress files, but since version 4 has yet to be released, it's impossible to say whether this remains true.

Even if PageMaker output presents no more problems than QuarkXPress's, printers may not know how to compensate for PageMaker's problems and eccentricities and thus *believe* that it poses more problems. QuarkXPress has had a decided advantage here simply by being the industry standard.

Web Publishing PageMaker took a big step in version 6.5 toward integrating Web publishing, but HTML integration is, for the most part, half-baked. The hypertext-links palette is well designed, but the palette used for actually exporting pages to HTML is hard to use. Most users will end up losing their links among PageMaker-created HTML pages. (The trick is to assign each page its own HTML-export style and then select the multiple export styles for simultaneous export. Assigning several pages to one export style merges them into one page, and exporting pages separately causes links among them to be removed.)

There's also no way to disable or even highlight print features and formats that won't export to the Web. This makes converting print documents and creating Web pages from scratch especially difficult. In any event, you still need a program like the $99 Adobe PageMill or the $119 BBEdit, from Bare Bones Software (617/778-3100, www.barebones.com), to fine-tune your HTML. If Adobe intends PageMaker to be a strong Web publishing tool as well as print publishing tool, it should work on moving more PageMill features into PageMaker or on tightening the integration of the two.

QuarkXPress has no Web publishing features, and the company's $995 QuarkImmedia XTension is really suited for CD creators, not Web publishers. Instead, you need to use Astrobyte's $495 BeyondPress (303/861-4861, www.astrobyte.com), Extensis's $149 CyberPress (503/274-2020, www.extensis.com), or HexMac Software Systems' $349 HexWeb (49 711/975-4961, www.hexmac.com). CyberPress is great for converting elements such as graphics, headlines, and blocks of text for use in a basic Web page. BeyondPress is best at converting and preserving complex layouts. HexWeb excels with heavily templated and indexed Web publications, such as online newspapers. All are good tools, but they add cost to QuarkXPress.

The one Web publishing area where PageMaker really shines is exporting to portable-document format (PDF). Many people use Adobe's PDF for online documents that need to be printed, such as forms or résumés, and for items that need to be preserved quickly, such as publication archives. PageMaker has a simple export menu command and can preserve all links within the document. QuarkXPress has no PDF export option; again, you need to buy an XTension.

Network Usage Neither program is particularly easy to use on a network. You can't store preferences in a central directory and have everyone's copy of QuarkXPress or PageMaker link to it. Instead, you need to copy the various preference files to every user's Mac.

Shared Specs QuarkXPress and PageMaker both let you create master template documents from which multiple users can import standard settings, such as those for colors and style sheets. QuarkXPress 4 lets you *select* which styles, colors, and so forth to import. PageMaker (like previous versions of QuarkXPress) imports everything.

Service-Bureau Support Both programs can automatically collect some files associated with a document (such as graphics) that your service bureau needs for printing the publication. QuarkXPress 4, however, still can't automatically collect relevant fonts or check for the files' integrity. Several plug-ins offer these features, such as the $399 Preflight Pro, from Extensis, and the $399 FlightCheck Pro, from Markzware (714/756-5100, www.markzware.com). PageMaker has font collecting and very basic file checking built in—a better approach.

Cross-Platform Support PageMaker and QuarkXPress both have a common file format between their Mac and Windows versions, making file transfer easy. Both also handle platform differences such as font-name remapping, ligature remapping (ligatures aren't available in Windows), and PICT/Windows Metafile translation. Both programs do a good job in supporting cross-platform users, although neither program has a cross-platform library format.

Look and Feel

One of the most profound differences between PageMaker and QuarkXPress is the interface. The programs come from different roots, and this shows both in the interface each uses and in how each expects users to interact with it.

Interface PageMaker's interface remains built on the paste-up metaphor, requiring the user to do more work. For example, each column of type is a separate

windowshade, or frame, and must be manually resized, moved, or deleted when you change the number of columns. You must also align each column manually.

QuarkXPress, by contrast, springs from a typesetter's background, in which you specify up front the parameters for each element. That's more setup work, but it also makes reworking easier. To use the multiple-column example, in QuarkXPress you create one box and specify the number of columns it has. The application handles the text width and alignment automatically. To change the columns, you just type a new number in the Cols field and QuarkXPress does the rest.

PageMaker utilizes tabbed palettes effectively, making its various control palettes easy to use. The palettes' pop-up menus group the common functions nicely. By comparison, QuarkXPress uses more-standard palettes, without the niceties of pop-up menus and tabs. QuarkXPress uses tabbed panes in its dialog boxes, which helps keep its incredible number of options manageable, while PageMaker tends to use separate dialog boxes linked via buttons.

Neither program uses Mac OS 8's contextual menus, although their Windows 95 and NT counterparts do. In both cases, this a puzzling and unnecessary omission (other programs incorporated contextual-menu support before Mac OS 8 shipped, and Mac OS 8 shipped months before QuarkXPress 4 will).

I find PageMaker's interface more visually pleasing and QuarkXPress's grouping of features more natural. PageMaker tends to scatter options throughout the program's menus or create more menu items than are necessary. Also, its plug-in interface relegates most plug-ins to a special menu, no matter what their function. Despite all this, some people prefer PageMaker's interface because they find it more free-form and creative.

All in all, it's a tie.

Extensibility There's no question: QuarkXPress's plug-in architecture is far stronger. There are hundreds of plug-ins (called XTensions) for QuarkXPress and just a handful for PageMaker. XTensions let users customize QuarkXPress, and they range from simple time-savers to powerful, highly-specific tools. (This is how users have effectively upgraded QuarkXPress for years.) Because XTensions can intertwine with QuarkXPress's interface, they look and act more like part of the program; by contrast, plug-ins for PageMaker often feel grafted on.

Macworld's Buying Advice

Based on the final-candidate release I used, I recommend QuarkXPress 4 as the page-layout program of choice for professional and semiprofessional users. QuarkXPress is simply more capable and flexible than PageMaker, and its layout approach will save you time over the long term. Service bureaus also prefer working with QuarkXPress files, saying that such files process more easily, saving the bureaus time and you money.

It's true that PageMaker costs less—not only is its list price $100 cheaper than QuarkXPress's but its street price also averages about $150 less. Still, the extra money that QuarkXPress costs (and the extra money many users spend to customize it with XTensions) is a very worthwhile investment.

Macworld will give QuarkXPress 4 an official rating once the product ships to customers, but unless something terrible happens in the final release, I expect a notably higher score for QuarkXPress 4 than PageMaker 6.5's Star Rating of ★★★/6.8 (see *Reviews*, May 1997).

Certainly, PageMaker does the job, and if you're happy with version 6.5, stick with it. Newcomers to desktop publishing will likely prefer PageMaker 6.5, because it mimics the manual paste-up approach they know—here's where PageMaker's major weakness for professionals becomes an advantage.

Web publishers will be disappointed with both—they remain print-oriented products. Quark acknowledges this by shunning Web features, but Adobe has gone all out to position PageMaker 6.5 as a full-featured Web publisher. If you're publishing on the Web in PDF format, you'll be very pleased with PageMaker. But PageMaker's built-in HTML-creation tools are not well integrated, and you'll need an HTML editor anyhow. As for QuarkXPress, several HTML-conversion XTensions do well converting print documents to HTML, but they're no substitute for an HTML editor if your primary goal is creating documents destined for the Web.

Although slow to upgrade its software, Quark has enjoyed the advantage of being ahead for many years and being able to watch first Aldus's and then Adobe's frequent but haphazard upgrades to PageMaker. PageMaker 6.5 achieved rough parity with QuarkXPress 3.3, but now QuarkXPress 4 is ready to go. Its significant new features pull the program back into the lead.

QuarkXPress 4 is not perfect, but it's a much better product all around than PageMaker 6.5. Therefore, QuarkXPress 3.3 users should get ready for a worthy upgrade and PageMaker users should think about trying QuarkXPress 4. Now may be the time to switch. m

GALEN GRUMAN, *Macworld*'s editor, is coauthor of ten books on desktop publishing, including *Macworld QuarkXPress 4 Bible* (1997), *PageMaker 6 for Macs for Dummies* (1996), *PageMaker 6.5 for Dummies Internet Edition* (1997), and the forthcoming *QuarkXPress 4 for Dummies* (all from IDG Books Worldwide).

Future Publishing: Top 10 Needed Features

PageMaker	QuarkXPress
Multiple-column frames	Integrated table editor
Character-based style sheets	Support for Photoshop plug-ins
Automatic text wrap around irregular shapes; enhanced support for clipping paths	Broader file-import support
Vertical justification	Support for contextual menus
Integrated table editor	Built-in em spaces
Selective import of colors, styles, and so forth	Support for network-based standard files and preferences
Automatic drop caps included as paragraph-formatting option	Enhanced collection utility for service bureaus
Support for network-based standard files and preferences	Use of pop-up menus in palettes
Fully integrated Web authoring tools, or tight, dynamic links to PageMill	Fully integrated Web authoring tools; built-in support for exporting to PDF
Bézier graphics tools	Cross-platform libraries

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God's Gift to Graphics Gurus Power Computing's PowerTower Pro 250 (bottom right) and Umax Computer's SuperMac S900/250 (top) and S900/250DP RAID (bottom left) are three of the fastest computers available for graphics and publishing pros

Macworld LAB TEST

Macworld Lab picks the best systems for publishing and graphics pros

POWERHOUSE PRODUCTION MACS

by Deke McClelland

Graphics and publishing professionals need the most-powerful computers they can get their mitts on. And despite all the hullabaloo about slipping sales and the intrusion of Wintel PCs into the graphics and publishing industry, the fact is that almost all of us use Macs.

We might drool with envy over the other side's preemptive multitasking and dynamic memory allocation, but the Mac continues to offer the advantages that matter most—systemwide color management, straightforward networking and expansion, reliable PostScript printing, and all the conveniences of the dominant industry platform. This is where the artists who make the big bucks do their work.

Macworld wanted to find the best Mac for graphics pros and the best for publishing pros, so we invited each Mac system vendor to submit the fastest machine in its arsenal—one single-processor system and, if available, one multiprocessor machine. What we ended up with was a collection of 11 superfast computers, 9 of them currently shipping. We broke down each of these systems to show you what makes them fast and what components professionals should pay special attention to.

But then everything changed. Our Editors' Choice Macs are made by clone vendors Power Computing and Umax Computer. While we were wrapping up this story, Apple pulled back drastically from clone licensing. As a result, Power Computing will stop selling Macs on December 31, Motorola and its licensees (notably APS Technologies) will ship only what remains in inventory; the fate of other vendors is unclear. It appears that Apple will honor its existing agreements with Umax until August 1998, but after that, it's likely to be *adios, muchachos.*

Depending on how you read the tea leaves, this is either a clarion call to buy up the clones or to stay the heck away. Clone manufacturers have lowered prices dramatically to clear out their inventories, so you'll be able to get fantastic Macs at *bargain* prices. At press time, Power Computing

PHOTOGRAPHS AND SCREEN IMAGES BY KEVIN CANDLAND

had dropped the price of the PowerTower Pro 250 by almost $700. In addition, Apple's newest system, the Power Macintosh 9600/300, was not significantly faster than the clones we tested and costs much more. If you need a fast computer and you need it now, you might be wise to snatch up one of the quick inexpensive clones while you can.

The trade-off is that when the cloners go away, so might your technical support or warranty. Apple says it will provide Mac OS support to Power Computing customers after December 31, but it will refer hardware problems to Power Computing. There will be risk involved for all owners of Mac OS clones. Personally, I'm inclined to gamble. I snapped up a Radius 81/110 about one month before Radius bowed out of the clone market, and despite the company's meager fortunes, I've received nothing but polite support. I've made three calls to Radius technical support in the last two years and have received three timely responses, which is more than I can say for Apple.

There will be risk involved for all clone owners. Personally, I'm inclined to gamble.

The Need for Speed

If you're a computer artist or a design professional, there's no such thing as fast enough. Laying out pages, processing high-resolution scans, and sharpening images are a few examples of the kinds of everyday operations that make even the best computers cough and sputter. Until these operations occur in real time—meaning you choose the command, and bang, it's done—your computer will slow you down. In other words, until computational delays are a thing of the past, a brush on screen will never work as well as a cheap pencil applied to paper.

Needless to say, things don't work in real time yet. Even on our choice for the best graphics machine—the SuperMac S900/250DP RAID, from Umax Computer (www.supermac.com)—it takes 8 seconds to apply the Gaussian Blur filter to a 16.7MB image with 100MB of RAM allocated to Adobe Photoshop. That's 50 percent faster than the 12 seconds the same operation takes on the slowest of our superfast machines—the MPower 604e200, from APS Technologies (www.apstech.com)—but it's hardly instantaneous.

Higher Speeds in Sight By the end of this year, you would have seen much faster machines from Motorola Computer Group (www.mot.com/starmax/) and Power Computing (www.powercc.com), but both companies are now out of the Mac-clone business. These canceled systems, based on the new PowerPC 750 chip (code-named G3), included the Motorola StarMax Pro 6000/300, which promised to be the fastest Mac of the year, according to Macworld Lab's preliminary tests, and the slightly slower Power Computing PowerTower Pro G3/275 (see "Upstart Macs," October 1997). These systems finished an astonishing 53 percent faster on average than the shipping Macs covered in this article, which are based on the PowerPC 604e chip. (They each did so with 32MB of RAM too, compared with 128MB in all the other systems.)

Instead, you'll see moderately faster systems from Apple, such as the now-shipping Power Macintosh 9600/300—which is based on a smaller and faster 604e CPU—as well as the soon-to-be-released 300MHz version of the Power Mac 8600. Tests

Where Multiprocessing Works Best

IN THEORY, two CPUs are capable of doing twice as much work as one. But in practice, the CPUs are at the disposal of the operating system. If the operating system supports symmetric multiprocessing—as do Unix and Windows NT—then any portion of any active application can run on any CPU. As long as the application is written to accommodate multiprocessing, it's possible for a second CPU to double the application's performance.

The problem is, multiprocessing was never very high on Apple's OS list. So while Apple concentrated its efforts elsewhere, DayStar came out with an original solution. The company's nPower extension was a system hack that allowed MP-aware programs such as Photoshop to divvy up operations so that different CPUs could work on different parts simultaneously.

With two CPUs, an operation can be completed in half the time, but only after it gets parceled out to the CPUs. The nPower extension, now integrated into Apple's regular OS releases, requires all Finder-level operations to run only on the primary CPU. This same CPU is likewise responsible for coordinating the activity of the secondary CPUs. Therefore, every operation incurs a slight delay while CPU number 1 delegates activities to itself and to CPU number 2 (plus numbers 3 and 4, if available). If you can imagine a two-person operation in which one person is the dictator and the other is a mindless robot, you have a rough idea.

And yet, a mindless robot is better than no robot at all. The secondary CPU eagerly pulls its weight when called upon to do so. To date, the list of software that benefits from multiprocessing includes the most recent versions of Deneba's Canvas, Adobe After Effects, Specular's Infini-D, Strata StudioPro, autodessys FormZ, Electric Image Animation System, and Apple's QuickTime and QuickDraw 3D extensions. But the most extensive acceleration occurs with Photoshop. The roughly 300 accelerated commands comprise essential filters (except for the revamped Gallery Effects filters incorporated into Photoshop 4), color-mode conversions, transformations, and color corrections.

Consider these Macworld Lab tests performed on a 16.7MB image with 100MB of RAM allocated to Photoshop: the Median filter (which averages pixels) set to a Radius value of 1 pixel completed its task in 5.5 seconds on a SuperMac S900/250DP RAID, compared with a little more than 9 seconds on a single-processor SuperMac S900/250. Here dual-processing delivers a 64-percent speed boost. But when the Radius value was raised to its maximum of 16, the SuperMac S900/250DP RAID clocked in at 46 seconds, compared with 87 seconds on the single-processor machine, an 89-percent speed improvement. The longer the

show the 9600/300 to be approximately 26 percent faster on average than the other shipping Macs we tested for this article—a worthy, but not tremendous, improvement.

Buy Now or Wait? Given that Apple's newest systems aren't dramatically faster and are considerably more expensive than our Editors' Choice systems—the SuperMac S900/250DP RAID and the PowerTower Pro 250—there's no overwhelming reason to buy them. These two Mac clones are extremely fast and will serve you well. Here are just a few reasons why the SuperMac S900/250DP RAID and the PowerTower Pro 250 are liable to remain attractive to the most-demanding users for the next few months:

- Although the first 250MHz 604e CPUs shipped this June, the basic motherboard design of the current systems is more than two years old. This suggests you can reasonably expect bug-free hardware.
- Because of Apple's drastic reduction in licensing the Mac OS, you'll be able to pick up a SuperMac S900/250DP RAID or a PowerTower Pro 250 at discounted prices in the months ahead. The prices of these machines have already dropped significantly from the time I started writing this article, and I anticipate the discounts to continue.
- Finally, graphic artists and page designers have performance needs that go beyond CPU design and clock speed. If you go out today and buy a SuperMac S900/250DP RAID equipped with 120MB of RAM and a 4GB RAID, and another shop waits several months (or more) to buy some equivalent from Apple, you'll have at least a calendar-quarter edge on the competition because you refused to wait for the technology to catch up with your needs.



The Cache Advantage Most of the shipping Macs we tested, such as the Umax SuperMac S900/250 shown here, have only a 512K Level 2 cache. The two fastest Macs—Apple's Power Mac 9600/300 and Power Computing's PowerTower Pro 250—each have a 1MB L2 cache, a decided speed advantage.

The CPU is the principal element of any computer, but if you treat it like the only purchasing criterion, you may end up wasting money that could be better spent elsewhere. The CPU, storage, and memory should all be considered partners in the ideal production system.

One Chip or Two?

Two years ago, your CPU choices were simple. The Mac with the fastest clock speed was the Mac to buy. But with time comes greater complexity. Not only do clock speeds seem to ramp every hour on the hour but you also have to decide what kind of PowerPC chip to buy and how many. You can outfit your new graphics workstation with just one CPU or as many as four.

Pros who spend most of their time with an application such as Photoshop, which was built to harness the speed of more than one processor, will really appreciate how much multiprocessing (MP) systems rip. But be aware that nonoptimized software—such as QuarkXPress and other publishing applications—can run *slower* on an MP machine. As a result, multiprocessor machines aren't the best choice for everybody. See the sidebar, "Where Multiprocessing Works Best," for details.

We looked at three computers that include multiple high-speed CPUs: Umax's SuperMac S900/250DP RAID, Apple Computer's (www.apple.com) Power Macintosh 9600/200MP, and DayStar Digital's (www.daystar.com) Genesis MP 932+.

- The SuperMac model ships with two CPU cards, outfitted with one 250MHz CPU apiece and connected by a ribbon cable.
- Apple's 9600/200MP includes a single card equipped with two 200MHz CPUs.
- The Genesis MP 932+ likewise contains a single card, but one with four 233MHz CPUs.

Umax argues that its two-card solution is the most flexible. If you bought a single-processor SuperMac S900/200, you could upgrade it to a multiprocessing Mac by purchasing and installing

secondary CPU can chew on the operation, the less time you'll spend waiting for it to finish.

With its four CPUs, the Genesis MP 932+ is even faster than the SuperMac S900/250DP RAID. It took only 4 seconds to apply the Median filter with a Radius of 1 and 26 seconds with a Radius value of 16. That's speed *boosts* of 37 percent and 77 percent, respectively.

The Future of Multiprocessing

The real speed benefits of multiprocessing will begin to manifest themselves next year when Apple delivers Rhapsody. In addition to catching up with Windows NT's preemptive multitasking and protected memory, the Next-spawned Rhapsody promises true OS-level symmetric multiprocessing. Applications developed according to Apple's so-called Yellow Box specifications will be able to divide operations equally amongst multiple CPUs. Alternatively, such applications will be able to run a particularly long operation—such as copying a series of files or rendering a 3-D illustration—in the background on one CPU while freeing up the other CPUs. If all goes according to plan, the multiprocessing Mac you buy today will work even faster a year from now.

The Right Options: What Each Graphics and Publishing System Offers

Company	Product	Star Rating [B]	Price [C]	SPEED-RELATED FEATURES: CPU Type 750	CPU Type 604e	CPU Speed	Cache	Bus Speed	MEMORY: RAM 128MB	RAM Slots
Apple Computer	Power Macintosh 9600/300	★★★/6.9	$4,898		1	300MHz	1MB	50MHz	●	12
(408/996-1010)	Power Macintosh 9600/233	★★★/6.6	$4,175		1	233MHz	512K	46.6MHz	●	12
	Power Macintosh 9600/200MP	★★★/6.2	$4,842		2	200MHz	512K	50MHz	●	12
APS Technologies (816/483-1600)	MPower 604e200	★★★/6.3	$2,087		1	200MHz	512K	40MHz	●	3 [E]
DayStar Digital [G] (770/967-2077)	Genesis MP 932+	★★★/5.9	$7,199		4	233MHz	512K	46.6MHz	●	12
Motorola Computer Group (800/759-1107)	StarMax Pro 6000/300	canceled	NA	1		300MHz	1MB	66MHz		4
	EDITORS' CHOICE									
Power Computing [G]	PowerTower Pro 250	★★★★/7.1	$3,299		1	250MHz	1MB	50MHz	●	8
(512/388-6868)	PowerTower Pro G3/275	canceled	NA	1		275MHz	1MB	50MHz		8
PowerTools (512/891-0646)	Infiniti 4200GT	★★★/6.2	$2,379		1	200MHz	512K	40MHz		3 [E]
	EDITORS' CHOICE									
Umax Computer	SuperMac S900/250DP RAID	★★★/6.2	$7,237		2	250MHz	512K	50MHz	●	8
(510/226-6886)	SuperMac S900/250	★★★/6.7	$3,858		1	250MHz	512K	50MHz	●	8

● = yes; NA = not available [A] All include one ADB, two serial, one external SCSI-1, two 16-bit stereo I/O, and one Mac video port unless otherwise noted. [B] Based on features, implementation, innovation, video come with a PCI video card installed. [E] Uses 3.3V DIMMs, which are not compatible with other Macs' 5V DIMM slots. [F] Has only VGA video connector. [G] Other configurations available. [H] Includes a

Umax's secondary 200MHz P-Series processor board (about $795). By contrast, if owners of last year's dual–180MHz-CPU Genesis MP 360+ want to upgrade to the Genesis MP 932+, they must toss the dual-CPU card and install a radically expensive ($3,599) replacement quad-processor card.

If you spend most of your time with Photoshop and your funds are unlimited, then the Genesis MP 932+—the fastest multiprocessor system around—is for you. But for most artists, having four CPUs is overkill. DayStar sells its computers direct, without such frills as a hard drive, RAM, a video card, and a keyboard; yet this *stripped-down* Genesis MP 932+ still sets you back $6,499. Compare this to the $7,237 for a SuperMac S900/250DP RAID with an internal Zip drive, 128MB of RAM, an iXMicro TwinTurbo video card, and an extended keyboard.

Besides, the Genesis MP 932+ is faster only when running MP-optimized tasks. For running standard, nonaccelerated operations, the SuperMac S900/250DP RAID is faster. Umax offers systems with fewer, but faster, CPUs at better prices.

The Drive Decision

The slowest element in any computer is the storage system. Hard-disk, removable-cartridge, and CD-ROM drives all shuttle information several orders of magnitude slower than electronic circuitry. Unfortunately, artists and designers rely heavily on these drives and their media. Every time you import an EPS document in Adobe Illustrator, play a QuickTime sequence, or so much as turn a page in QuarkXPress, you're accessing a disk. If you've ever put off saving a 100MB image in Photoshop until the next bathroom break, you know what it's like to subconsciously shun your storage system.

Say Yes to SCSI, No to IDE The solution is to purchase the fastest hard drive and connections you can lay your hands on. First, artists need SCSI inside and out of the box. In the old days, SCSI was a given, but clone vendors are increasingly integrating lower-cost, industry-standard components. The MPower 604e200, from APS, and the Infiniti 4200GT, from PowerTools (www.pwrtools.com), shipped to Macworld Lab with PC-style Enhanced IDE internal hard drives, which are generally less expensive but slower than SCSI-based drives. Both computers include an internal SCSI connection, but unless you specifically request internal SCSI drives, the connection goes unused. (For an extra $90, you can purchase the MPower 604e200 with a 2GB Quantum SCSI drive; PowerTools preconfigures its systems with IDE drives only.)

The moral of the story: 2 CPUs + 1 RAID = smokin'.

Not surprisingly, the two machines that have an IDE drive came in dead last in Macworld Lab's disk-intensive SpeedMark tests. Spooling a 38-page document from QuarkXPress took 109 seconds on the Infiniti 4200GT and 122 seconds on the MPower 604e200, compared with a relatively short 82 seconds on the other 200MHz machine we tested, the Power Mac 9600/200MP. That's a time savings of 25 and 33 percent, respectively—despite the inherent delays in working with a nonaccelerated application on a multiprocessing system—almost entirely thanks to SCSI.

Another benefit of SCSI is expandability. If you're a typical publishing professional, you probably own two or three hard drives, a CD-ROM drive, an aging SyQuest drive, at least one

VIDEO DISPLAY			STORAGE					EXPANSION [A]						COMMUNICATIONS	
					CD-ROM Drive					Internal Bus					
Standard VRAM	Max VRAM	Onboard Circuitry [D]	Free Bays	Hard Drive 2.0GB–4.0GB	16×	12×	8×	Zip Drive	Case	PCI Slots	Ultra SCSI	SCSI-2	SCSI-1	EIDE	Modem	Ethernet
8MB	8MB		3	4.0GB	24×			option	tower	6		●				10BaseT
4MB	8MB		2	4.0GB		●			tower	6		●				●
4MB	8MB		2	4.0GB		●			tower	6		●				●
2MB	4MB	● [F]	4	2.0GB	●			option	tower	5		option		●	option	option
			7	2.0GB	●				tower	6		●				●
8MB	8MB		2	4.0GB	24×			●	tower	3	●		●	●		●
8MB	8MB		6	2.0GB	24×			option	tower	6		●				●
8MB	8MB		6	4.0GB	24×			option	tower	4	●	●				●
2MB	4MB	● [F]	4	2.0GB	●			option	tower	5			●		option	option
8MB	8MB		4	2 x 2.1GB [H]			●	●	tower	6		●				100BaseT
8MB	8MB		4	2.1GB			●	●	tower	6		●				100BaseT

performance, reliability, ease of use, and value. [C] *All prices are company estimates, except for those from APS Technologies, DayStar Digital, and PowerTools, which are direct prices.* [D] *All systems with no onboard striped RAID.*

Zip drive, and either a magneto-optical or Jaz drive (or perhaps both). If you work in the fast lane, you also have a CD-ROM writer and a tape backup system. So it's absolutely imperative that you purchase a computer with a maximum of drive flexibility. Apple, DayStar, Power Computing, and Umax sell towers equipped with Fast SCSI-2 connections internally and standard SCSI-1 ports for external connections. If you manage to terminate everything properly—praying and animal sacrifices are optional—you can daisy-chain a total of seven drives inside the box (if it's big enough) as well as another seven drives outside.

Ultra SCSI and RAID The SuperMac S900/250DP RAID goes several steps further. It ships with a PCI card that includes internal as well as external Ultra SCSI connections for the fastest hard-disk access possible. That same card also provides 100BaseT Ethernet—that's in addition to standard 10BaseT—for high-capacity network connections.



Top-Speed Photoshop Our Editors' Choice for image editing and graphics, the Umax S900/250DP RAID offers blazing speed—ideal for people who spend most of their time with MP-aware applications such as Photoshop.

But Umax doesn't stop there. To enhance the speed of disk-based operations, the SuperMac S900/250DP RAID comes preconfigured with a two-drive RAID. This means you can read from or write to both disks simultaneously, effectively doubling the speed of all disk operations. It's a lot like symmetric multiprocessing for disks.

This combination of multiprocessing and multidisking makes for an expensive computer. The fully equipped SuperMac S900/250DP RAID costs nearly $3,000 more than its single-CPU cousin, the SuperMac S900/250, and nearly $2,500 more than Apple's multiprocessing Power Mac 9600/200MP, which has a slower clock speed. But if you can afford it, the machine delivers. The SuperMac S900/250DP RAID placed first in about 65 percent of our Photoshop tests and nearly all of our QuarkXPress tests (which were heavily disk-dependent). In the QuarkXPress print job mentioned earlier, the S900/250DP RAID took only 64 seconds, a 91-percent speed improvement over the slowest machine, APS's MPower 604e200, and 25 percent faster than our other Editors' Choice pick, the PowerTower Pro 250. The moral: 2 CPUs + 1 RAID = smokin'.

Relying on RAM

The other big speed booster is RAM. Three kinds of RAM are at work inside your computer: dynamic RAM (DRAM), which

makes up the memory; static RAM (SRAM), which serves as the cache; and video RAM (VRAM), which feeds the monitor. Although RAM speed varies, all three types are much faster than the mechanical storage systems, so their purpose is to store the data you need and use most often.

Dynamic RAM A studio photographer I know claims that Photoshop doesn't really start to work properly until you equip your Mac with 1GB of RAM. That seems a little extravagant, but clearly it's hard to get professional-quality work done with anything less than 128MB. Photoshop runs best when all open images consume at most one-third of the total RAM assigned to the application. A typical letter-size 267-pixels-per-inch RGB image with layers consumes about 30MB, so 128MB of RAM gives you a nice 90MB chunk to assign to Photoshop, with 38MB to spare for the system and one or two other applications.

But Photoshop isn't the only application that benefits from RAM. Offline video editing, 3-D rendering, page layout, and 2-D illustration likewise speed up when extra RAM is allocated in their direction. Scores on our general SpeedMark CPU tests—which encompass graphics, business, and scientific applications—jumped an average of 12 percent when we increased the RAM from 32MB to 128MB, roughly equivalent to a 50MHz increase in CPU speed. With DRAM priced at $6 per megabyte, it's one of the most cost-effective upgrades you can make.

Level 2 Cache If the CPU is the Sun and your data spins around it like planets, then hard disks and other storage are the outer planets, DRAM is Earth, and levels of cache are Venus and Mercury. The cache holds the OS and application routines that your computer needs most frequently.

All Macs include two levels of cache: one that resides inside the CPU chip (Level 1, or L1, which would be Mercury) and another provided elsewhere on the motherboard as SRAM (Level 2, or L2, which would be Venus). Data can be retrieved about ten times as fast from L1 cache as from L2 cache and about ten times as fast from L2 cache as from DRAM. Meanwhile, the capacity of the L1 cache is limited to a paltry 32K, compared with as high as 1MB for the L2 cache on a PowerPC 604e.



Bargain Bombshell Our Editors' Choice Mac for publishing, Power's PowerTower Pro 250, is the second-fastest shipping Mac we tested for this story *and* one of the least expensive.

Most of the systems we tested have a 512K L2 cache (which is soldered onto the board, making it impossible to upgrade).

It's ironic that the best Macs for professional artists and designers aren't from Apple.

The two shipping exceptions to this rule are the PowerTower Pro 250 and the Power Mac 9600/300, which each have a 1MB L2 cache. This small enhancement gives both systems a performance edge over the next-fastest rival, the single-processor SuperMac S900/250, in our SpeedMark CPU tests. The fact that the PowerTower Pro 250 with 128MB of RAM costs nearly $1,600 less than a similarly configured Power Macintosh 9600/300 makes the PowerTower Pro system the better buy.

L2 cache will have a more dramatic effect on the speed of future computers. The backside cache included in the PowerPC 750 design increases by as much as 600 percent the speed at which the CPU and L2 cache can swap data (see "275MHz Mac Powerhouse," September 1997). Although Apple hasn't yet announced a PowerPC 750–based Mac, it's just a matter of time. Meanwhile, in-line–caching schemes—like that of Apple's Power Macintosh 9600/350 and Umax's CacheDoubler technology (currently included with the company's C-series Macs)—bypass the standard system bus and double the exchange speed between a 604e CPU and its L2 cache.

Driving Your Big, Beautiful Monitor It doesn't matter one whit how fast things speed along if you can't accurately gauge the progress of your artwork and page designs on screen. Even if you don't have a 21-inch calibrated monitor right now, you want to be ready when that special monitor arrives at your office. That's why you need a video card that has at least 4MB (possibly 8MB) of VRAM.

Again, this disqualifies the APS MPower 604e200 and the PowerTools Infiniti 4200GT we tested from serious consideration. In order to keep prices low—either machine can be had for less than $3,000—both computers ship with 2MB of VRAM each, enough to display 24-bit color on a 17-inch screen, but it's slow and hardly satisfactory for a two-page display. In our SpeedMark Video benchmarks, the next-slowest machine—the Apple Power Macintosh 9600/233—was twice as fast as either the MPower 604e200 or the Infiniti 4200GT.

The Power Mac 9600/233 and 9600/200MP each have 4MB of VRAM—which permits 24-bit color up to 1,152 by 870 pixels (21-inch monitor resolution)—while the Umax and Power Computing machines ship with 8MB each—24-bit color up to 1,600 by 1,200 pixels (24-inch monitor resolution). Since our two Editors' Choice picks come with 8MB, we figure the more VRAM the merrier. But many artists will rarely, if ever, venture beyond 1,152 by 870 pixels.

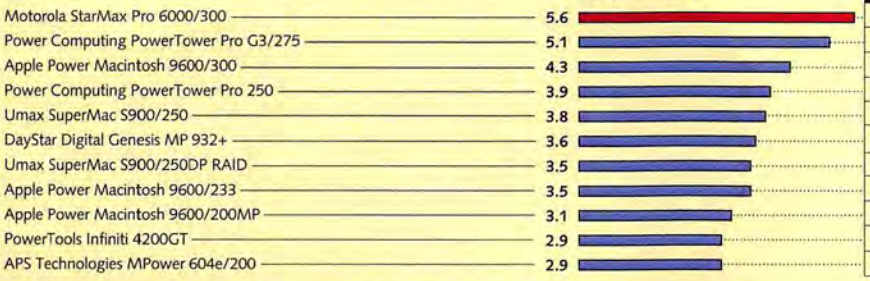
Although they are useful for viewing large images, higher resolutions make text and icons so small that they become painfully difficult to make out. And switching back and forth between resolutions has an annoying habit of messing up the

Macworld LAB TEST

Graphics Speed Demons

Graphics and publishing pros need computers that can process and print big files fast, so their ideal Macs have one or more high-speed processors, lots of L2 cache, and a zippy hard drive. When you add price to this list of requirements, it's clones that are the best computers around; unfortunately, their days are numbered. In our testing, Motorola's prototype CHRP system, the StarMax Pro 6000/300, blazed past the competition, but as a result of Apple's recent licensing decisions this computer will never ship. Our current pick for most publishing pros is the PowerTower Pro 250, one of the least expensive Macs and the second fastest. (Although Apple's Power Macintosh 9600/300 is 10 percent faster, it costs $1,600 more.) If you live in Adobe Photoshop, you should get a Umax SuperMac S900/250DP RAID. Applications that aren't optimized for multiprocessing run more slowly on this machine, as its SpeedMark reflects, but few Macs run Photoshop faster.

Best overall performance. Longer bars are better. Bold indicates best result in a specific test. An Apple Power Macintosh 7100/80 with our standard configuration (32MB of RAM) has a SpeedMark score of 1.0.



	CPU	FPU	Disk	Video	Star Rating
Motorola StarMax Pro 6000/300	**6.2**	**5.4**	**3.9**	**9.8**	canceled
Power Computing PowerTower Pro G3/275	5.9	5.2	2.8	9.4	canceled
Apple Power Macintosh 9600/300	4.9	4.3	2.5	7.4	★★★/6.9
Power Computing PowerTower Pro 250	4.4	3.8	2.5	7.6	★★★★/7.1
Umax SuperMac S900/250	4.2	3.7	2.5	7.3	★★★/6.7
DayStar Digital Genesis MP 932+	3.9	3.0	3.0	6.1	★★★/5.9
Umax SuperMac S900/250DP RAID	3.9	3.3	2.6	6.6	★★★/6.2
Apple Power Macintosh 9600/233	3.9	3.4	2.3	6.9	★★★/6.6
Apple Power Macintosh 9600/200MP	3.4	2.8	2.1	6.0	★★★/6.2
PowerTools Infiniti 4200GT	3.3	2.9	1.9	3.0	★★★/6.2
APS Technologies MPower 604e/200	3.3	2.9	1.7	3.1	★★★/6.3

Behind Our Tests

We tested all these Macs (except the StarMax Pro 6000/300 and the PowerTower Pro G3/275) loaded with extra RAM—128MB rather than our standard 32MB—to reflect professional configurations. As a result, scores are higher than usual. The scores of the Power Macintosh 9600/300 and PowerTower Pro 250 (as well as those of the canceled systems) also reflect a 1MB L2 cache. The other systems each ship with a 512K L2 cache. For detailed information on our systems benchmarks, see *Mac Superguide*, September 1997.—**Macworld Lab testing supervised by Mark Hurlow**

placement of desktop icons. So if you have the choice of purchasing your own video card—as with the DayStar Genesis MP 932+—you might consider saving yourself $200 by settling for 4MB of VRAM.

Macworld's Buying Advice

In light of Apple's recent moves to cut off clone vendors, it's ironic (or it just plain figures) that the best Macs for professional artists and designers come not from Apple but from Power Computing and Umax. The fact that these soon-to-be-extinct systems are priced to sell makes your choice that much more difficult. Should you go for the discounts and hope either that you never need service or that service is available when something goes wrong? Or should you play it safe, wait for the dust to settle, and buy an Apple machine once Apple is again the only player in town?

If you decide to gamble, we can tell you that for the time being, these are excellent machines. Power Computing has developed a reputation for shipping fast and affordable systems and the PowerTower Pro 250 is no exception. Overall the second-fastest shipping machine in our SpeedMark Lab tests, the PowerTower Pro 250 costs less than any machine discussed in this article except the MPower 604e200 and the Infiniti 4200GT, both of which are considerably slower. The runner-up is the Apple Power Macintosh 9600/300. Although it's 10 percent faster than the PowerTower Pro 250, it costs about $1,600 more. The PowerTower Pro 250 is by far the better value.

If you're willing to spend more in exchange for spending less time with Photoshop and other MP-accelerated applications, then the dual-processor SuperMac S900/250DP RAID is the system for you. This top-of-the-line graphics workhorse scored lower in our overall SpeedMark tests because most of our tests rely on MP-unaware applications. But any time disk operations or multiprocessing came into play, the SuperMac S900/250DP RAID came out well ahead. And when symmetric multiprocessing becomes a reality, it will perform even better. For what it's worth, this is the machine I would buy. **m**

Contributing Editor DEKE McCLELLAND (www.dekemc.com) chronicled the work of 16 prominent Macintosh artists in *Photoshop 4 Studio Secrets* (IDG Books Worldwide, 1997).

EDITORS' CHOICE

Image-Editing and Graphics System

★★★/6.2 **Umax SuperMac S900/250DP RAID** Dual CPUs and two internal Ultra SCSI RAIDs make this an expensive system, but it works miracles with Photoshop. **Company:** Umax Computer (510/226-6886, www.supermac.com). **Company's estimated price:** $7,237 (with 128MB of RAM).

Publishing and Design System

★★★★/7.1 **Power Computing PowerTower Pro 250** This superfast, affordable Mac is perfect for designers whose time is evenly split between Adobe Photoshop and Illustrator and QuarkXPress. **Company:** Power Computing (512/388-6868, www.powercc.com). **Company's estimated price:** $3,299 (with 128MB of RAM).

REAL PRODUCTS REAL RATINGS

Reviews you can trust Unlike other publications, *Macworld* rates only final shipping products, not prototypes. What we review is what you can actually buy.

EXPERIENCE PAYS OFF: THE 3X ZOOM.

And we've had more than enough experience, 78 years to be exact, to make it all worthwhile. With an insistence on superior optics, an obsession with design and size, a never-ending search for the optimum in effortlessness as well as ergonomics, it's little wonder that Olympus has pushed the 35mm envelope as far as we have. And now all that know-how and wizardry has been poured into our D-600L digital camera. Yes, it looks like a 35mm and feels like a 35mm. And often acts like one, too.



Your computer, our camera and bundled software. Now crop, enlarge, enhance, retouch, have fun.

The new 3x zoom lens is razor-sharp, seven element Olympus all glass aspherical, F2.8, autofocus, with macro. The equivalent 35mm zoom focal length: 36mm to 110mm.

Some other distinctions: a mere 16.5 ounces in weight; center weighted metering as well as spot metering for difficult lighting conditions; dioptric viewfinder correction; +/- 3 step exposure correction; a four mode auto flash with red-eye reduction.

MEGA PIXELS

Mega is an understatement. The CCD resolution on the D-600L is an astounding 1.4 million pixels, creating images at 1280 x 1024 pixel resolutions. Speaking of images, the D-600L uses a high-quality progressive scan CCD that captures the entire image in a single pass. Meaning you get what you should get: the highest-quality film-like images without any annoying ghosting or color bias traits that often appear in competitive sensor technologies.



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THE TTL IS VIP

A Very Important Part. It's a Through The Lens single lens reflex viewfinder so you're shooting photos as if you were looking through a 35mm SLR camera. Crisp, exact, infinitely superior images can be expected. In addition, there's a high definition LCD screen that you can use for reviewing, deleting or tagging images for printing.

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Finally, digital independence! Now you can connect the D-600L, or any Olympus digital camera, directly to our P-300 Personal Photo Printer. In just minutes you'll be able to print photo quality images directly from the camera.



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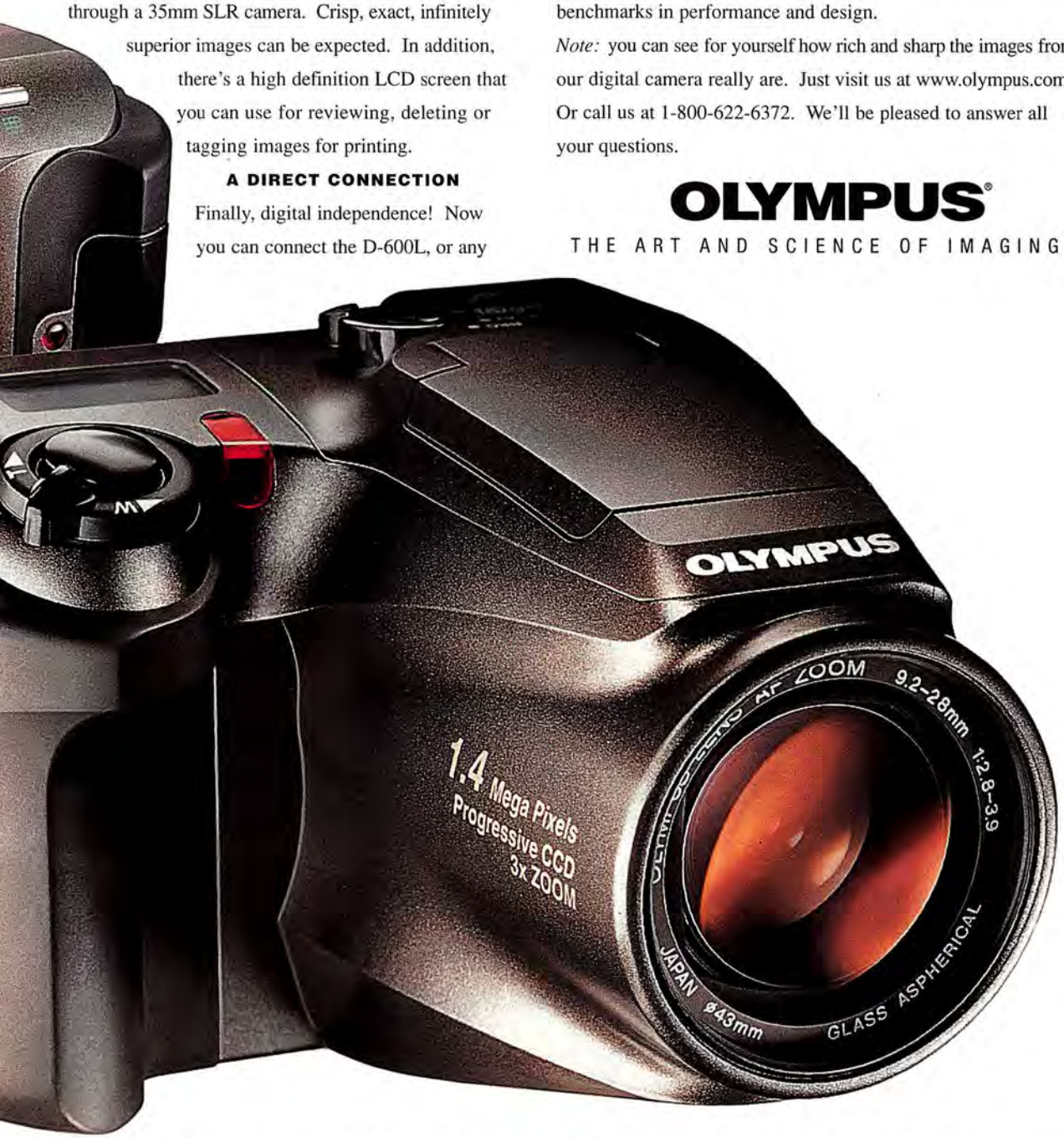
Note: our more affordable D-500L also has a 3X zoom lens with an equivalent 35mm focal length of 50mm to 150mm and a resolution of 1024 x 768.

Note: in the last year, Olympus digital cameras have won more awards than any other digital cameras. Journalists and industry experts are already hailing our new D-600L and D-500L as benchmarks in performance and design.

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Our favorite flatbed delivers accurate results fast

Macworld LAB TEST

ROBERT PERRY

SCANNERS THAT GET THE DETAILS

by Peter M Stoller

MEETINGS, MEETINGS, MEETINGS: the endless routine of publishing. No, not just the conference kinds of meetings—I'm talking about meeting budgets, meeting deadlines, meeting quality standards. When your job entails capturing and editing images for print publication, you're always dealing with one "meeting" or another. So who's got time to wrestle with inferior scans?

Fortunately, the current crop of flatbed scanners in the $1,000-to-$2,000 price range offers affordable, professional-quality images. But which scanner best earns a spot on that already crowded piece of real estate—your desktop?

To find out, Macworld Lab put seven midpriced color flatbed scanners (with transparency adapters) through a series of tests. Our panel of experts then reviewed each scanner's printed output for color accuracy and resolution of detail. We tested each model's previewing and scanning speeds, and we evaluated the features and ease of use of the software that comes with each device. Finally, we sorted through the various scanner bundles and price tags, looking for an overall favorite. It wasn't hard to find one.

The most important aspect of a scanner is image quality, the faithfulness with which the device captures the colors and details of the original art. All these scanners have the same basic mechanics: 600-dpi optical resolution and 36 bits of color. The mechanics tell you how much data a scanner captures but not how accurate that data is, which is why image-quality results vary from one scanner to another.

Likewise, the sheer number of colors doesn't guarantee quality, although it helps. Even the most accurate digital color is only an approximation, a subset of the visible spectrum broken down into levels and then adapted to represent a broader range of continuous tones.

How did our group of scanners perform? Overall, Epson America's Expression 636 Professional (www.epson.com) generated images with

Scanners in Focus

To test image quality, we scanned two versions of the same color image—a printed photograph and a slide transparency—on each scanner. To make side-by-side quality comparisons easy, we've merged the two resulting scans to make one image. The photo scans appear on the left, with the transparency scans on the right.

To get a sense of how each scanner handles image detail, look at the texture of the fabric, the sprigs of thyme, and the grains of paprika in the various output samples and compare them with the same elements in the original image, which a service bureau digitized using a drum scanner. For color accuracy, note the differences in how the scanners handled yellow and magenta.





Professional Drum Scan A highly skilled technician operating equipment that might retail for $1,000 or more is able to achieve scans that you couldn't possibly hope to duplicate. Not only are the colors in the scan perfectly true to the original, but also the details are razor-sharp.





Epson Expression 636 Professional The sharpness is stunning, thanks to the LaserSoft SilverFast plug-in's unsharp-masking tool and Epson's fine hardware. The color lacks the vibrancy of the original, but SilverFast's color tools can do for color what the program's sharpening tool does for detail.





Microtek ScanMaker III The ScanMaker III's greenish yellows, poor shadow detail, and general lack of sharpness keep it out of contention. Unfortunately, the accuracy of the scanner's ScanWizard plug-in's endpoint tools is poor: Manual adjustments are unreliable, and the automatic range option clips the endpoints.





Pacific Image Electronics ScanAce III The ScanAce III's images look pretty much just like brighter versions of the ScanMaker III's, including the soft details and the posterized lemon. Speaking of lemons, the real lemons are the two scanning utilities that ship with the ScanAce III.

Details, Details

Company	Product	Star Rating*	Price (list/ company's estimated)	Phone Number	Maximum Scanning Area (in inches)	Document-Feeder Price/Capacity (in pages)
Epson America	EDITORS' CHOICE Expression 636 Professional	★★★★/8.0	NA/$1,399	310/782-0770	8.5 x 11.7	$449/30
La Cie	Silverscanner IV Prepress	★★/4.9	NA/$1,099	503/844-4500	8.5 x 11.7	$499/30
Linotype-Hell	LinoColor Saphir	★★★/6.6	$1,849/NA	516/434-2000	8.4 x 11.7	NA
Microtek	ScanMaker III	★★★/5.2	NA/$1,499	310/297-5000	8.5 x 14.0	$400/50
Pacific Image Electronics	ScanAce III	★★/4.3	NA/$1,199	310/214-5281	8.5 x 14.0	$379/20
Polaroid	CS-600 Scanner	★★/4.8	$1,495/NA	617/386-2000	8.5 x 14.0	NA
Umax Technologies	PowerLook II	★★★★/7.4	$1,895/$1,765	510/651-4000	8.3 x 11.7	NA

*NA = not available. * Based on features, implementation, innovation, performance, reliability, ease of use, and value. ** Transparency adapter is a separate purchase of $649 without Professional bundle. *** Transparency adapter is*





La Cie Silverscanner IV Prepress Based on the same device as the Epson Expression 636, the Silverscanner offers warmer and darker colors. The Silverscan III PS plug-in lacks the level of control necessary to fine-tune the color, and it lacks the sharpening tools to produce a clearer-looking scan.





Linotype-Hell LinoColor Saphir The Saphir captured good detail with the LinoColor VisuaLab Photoshop plug-in. Color, however, is VisuaLab's forte. If you can conquer the program's many levels, fixing problems such as the heavy magenta cast in the transmissive scan should be a snap.





Polaroid CS-600 Scanner Identical to the Microtek ScanMaker III right down to the scanning plug-in and sluggish speed, the CS-600 is bundled with DCR Calibrator but lacks the IT8 color targets, without which the DCR software is useless. Therefore, the uncalibrated CS-600 scans come out as worse versions of the Microtek's.





Umax PowerLook II The PowerLook II is a darned-good scanner, but the bundled Binuscan PhotoPerfect Master software is what makes it special. We like most of what it did with default settings. With some minor tweaking, you could easily tame the strident picnic table and the curry colors and improve the shadow detail.

Transparency-Adapter Price/Maximum Scanning Area (in inches)	Bundled Software
included**/8.5 × 11.7	LaserSoft SilverFast, Epson Scanning Utilities, Adobe Photoshop, MetaTools, Kai's Power Tools SE, Live Picture SE, Second Glance Software ePaper, Claris Home Page
$699/8.0 × 10.0	Silverscan III PS plug-in, Adobe Photoshop, Xerox TextBridge
integrated/8.3 × 10.0	LinoColor VisuaLab application and Photoshop plug-in, LinoColor CaptureProfiler, Linotype Library's Fonts Just In Time CD, Adobe Photoshop, Xerox TextBridge Classic
included/8.0 × 10.0	Microtek ScanWizard, Adobe Photoshop, Xerox TextBridge Pro, Microtek DCR Calibrator (software and color target)
included***/8.5 × 13.0	PIE CyberView, JetSoft Art-Scan, Adobe Photoshop or Live Picture, Xerox TextBridge Classic
$495/8.0 × 10.0	Polaroid CS Scanner plug-in, Live Picture SE, Caere OmniPage LE, Digital Collections ImageAXS Digital Content Manager, DCR Calibrator (software only)
included/8.3 × 10.0	Umax MagicScan plug-in and application, UmaxShare, Umax AutoScan, Umax MagicMatch, Scanner extension (Apple scanner emulator), Adobe Photoshop, Binuscan PhotoPerfect Master

a separate purchase of $379 with other versions of the scanner.

outstanding resolution; it was followed by Umax Technologies' PowerLook II (www.umax.com) and Linotype-Hell's LinoColor Saphir (www.linocolor.com), both of which produced respectable-but-no-cigar images.

When scanning in reflective mode, six of the seven scanners did a decent job of interpreting the colors in our test image and color swatch. Only the dingy output of Polaroid's CS-600 Scanner (www.polaroid.com) earned low marks from our panel. When we used the scanners in transmissive mode, color accuracy was significantly worse. We weren't terribly surprised, though, because these models are primarily designed to be reflective scanners. (See the sidebar, "Scanners in Focus," to compare the output samples from the scanners.)

Scanning Speed

Accurate scans are as essential to productivity as they are to quality, saving you immeasurable time in postscan editing. Scanning speed is also critical, however, because time spent waiting is time wasted. Fast previews are especially important, as prescan editing makes up the bulk of the time you spend working with a scanner.

The fleet Epson Expression 636 Professional led the pack again, previewing about nine times as fast as the snail-like Polaroid CS-600 Scanner and the Microtek ScanMaker III (www.microtekusa.com). The Epson unit was also the fastest at gray-scale scanning and came in less than half a second behind the front-running LinoColor Saphir at color scanning.

La Cie's Silverscanner IV Prepress (www.lacie.com), which is based on the same device as the Epson scanner, did well in our gray-scale preview and scanning tests but dawdled during color image scans. Pacific Image Electronics' ScanAce III (www.scanace.com) was a mostly middle-of-the-road performer. (For complete speed results and image-quality ratings, see the benchmark, "Fastest Scanner Delivers Top-Quality Results.")

A Scanner Is Only as Good as Its Software

Quality hardware gives you the potential to produce great scans, but achieving that potential requires the right software.

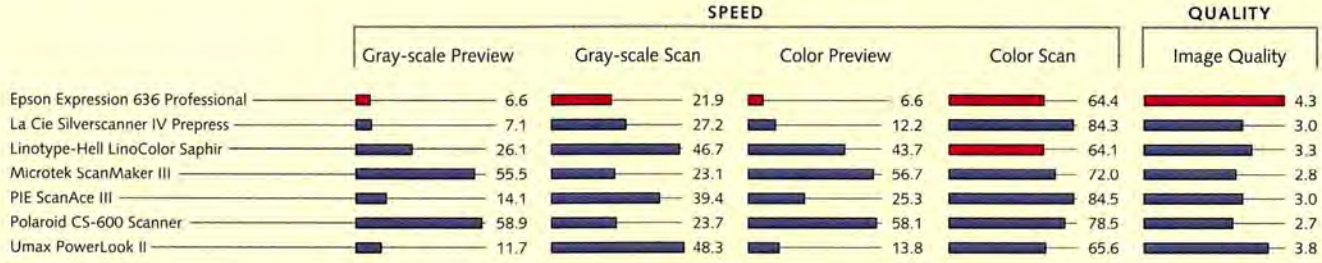
Case in point: LaserSoft SilverFast, the scanning plug-in bundled with the Expression 636 Professional, has everything we would want in a plug-in. It offers

Macworld LAB TEST

Fastest Scanner Delivers Top-Quality Results

Image quality is the most important consideration when choosing a scanner. In our quality tests, two scanners, the Epson Expression 636 Professional and the Umax PowerLook II, stood out from the pack. The Epson scanner, our Editors' Choice pick, also was by far the fastest overall.

Best overall performance. Speed results are in seconds; shorter bars are better. Image quality is based on a 5-point scale; longer bars are better.



Behind Our Tests

To test a scanner's speed, Macworld Lab measured the prescan time (in color and gray scale) and the final scan time for two 8.5-by-10-inch images, one color and one gray scale, at 300 dpi. All scanners were tested using their default settings. We allocated 30MB of RAM to Adobe Photoshop when a scanner plug-in was involved, or 30MB to the scanner applications themselves, so that disk access (performance of the hard drive) is not factored into the timings. All tests were performed on a Macintosh 7300/200 (System 7.6.1) with 64MB of RAM, a 256K L2 cache, a 17-inch Apple multisynchronous monitor set to millions of colors, 832 by 624, disk cache set to 1024K, virtual memory and RAM disk disabled, and AppleTalk enabled.

To judge image quality, a panel subjectively evaluated scans from each product produced at its default settings. We rated each scanner on a scale of 1 to 5 (with 1 unacceptable and 5 excellent) for color fidelity, sharpness of detail, accurate gray reproduction, and highlight and shadow detail.—**Macworld Lab testing supervised by Jeff Sacilotto**

lightning-fast previews; a big preview window; clear, accurate editing feedback; support for scanning in RGB, CMYK, and Lab Color spaces; plus powerful, intuitive, and well-organized controls for every aspect of scanning. SilverFast's unsharp-masking tool is one of the best we've seen—witness the sharpness of our Expression 636 Professional scan—and its other tools are similarly impressive.

By contrast, Epson's own TWAIN plug-in is clunky and buggy. Its features, color fidelity, and speed are notably inferior to SilverFast's, and we also encountered "low memory" and spurious "can't find scanner" errors. Clearly, much of the value in the Expression 636 Professional scanner bundle is in SilverFast. Unfortunately, other, less expensive Expression 636 bundles, such as the Expression 636 Executive, don't come with SilverFast.

Another top software utility is Binuscan PhotoPerfect Master, a color-correction utility bundled with Umax's PowerLook II. PhotoPerfect is notable for its rare blend of flexibility, power, and hands-off simplicity. The utility runs in the background with minimal interaction; you scan, and PhotoPerfect fixes. While we achieved good results with Umax's fine MagicScan plug-in, PhotoPerfect did better—effortlessly.

PhotoPerfect Master also performs impressive on-the-fly CMYK separations. SilverFast separates CMYK on the fly, too, but it uses Photoshop's engine to do it—far from the best tool for that job.

A third utility, LinoColor VisuaLab, uses ultrasophisticated color-editing and -separation tools inherited from Linotype-Hell's top-of-the-line Topaz. The comprehensive documentation and tutorial are vital, because VisuaLab's learning curve is as steep as the program is deep. Incredibly, neither VisuaLab nor its companion Adobe Photoshop plug-in displays the effects of sharpening in prescans—a major drawback. Nevertheless, VisuaLab is a powerful tool in the hands of a savvy operator. It's ideal for integration into an existing LinoColor setup and offers the ultimate in hands-on color control for this price range.

Macworld's Buying Advice

For most graphics professionals in need of a midpriced flatbed scanner, we heartily recommend the Epson Expression 636 Professional. Its $1,399 price for the scanner/transparency-adapter bundle is beaten only by that of the poorly rated PIE ScanAce III—yet the Epson scanner outperformed all comers in speed, image quality, software, and ease of use.

Although it's not quite in the same league as our Editors' Choice scanner, the Umax PowerLook II is also worthy of consideration. Its image quality and speed fall just short of the Epson scanner's. Furthermore, the PowerLook II has a respectable Photoshop–plug-in interface and comes with the awesome Binuscan PhotoPerfect Master. The PowerLook II is more expensive than the Expression 636 Professional, but if you need on-the-fly CMYK separations, the PowerLook II might better meet your needs. And speaking of meetings, isn't it time for you to get back to work? m

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EDITORS' CHOICE

★★★★/8.0 **Epson Expression 636 Professional** The best scans, the best scanning software, the fastest overall, and the second-lowest price of any scanner with a transparency unit in our survey combine to make the Expression 636 Professional an easy choice. **Company:** Epson America (310/782-0770, www.epson.com). **Company's estimated price:** $1,399.

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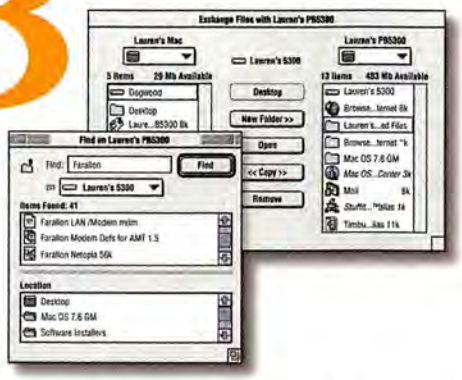


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by Wendy Sharp

FileMaker Hits The Web

Latest version gets HTML-savvy

IF YOU'RE A FILEMAKER PRO USER who has been waiting with bated breath for version 4.0, go ahead and exhale. When it comes to database features, Claris's FileMaker Pro 4.0 isn't a major upgrade—although for sharing your data with other users, this version offers a giant step forward.

With the $199 ($99 upgrade) FileMaker Pro 4.0, small businesses and home users who would rather not spend a great deal of time designing a Web site can quickly post dynamic price lists, catalogs, address books, or photo albums on the Web, and workgroups using a TCP/IP network can now browse and modify their existing FileMaker Pro databases via their Web browsers.

It's true that FileMaker's new Web publishing features are something that you could have had at any time this past year, using a program such as Lasso, from Blue World Communications (www.blueworld.com); Tango for FileMaker Pro, from EveryWare Development (www.everyware.com); or Web FM, from Web Broadcasting (www.webfm.com). However, using those products is a complicated process involving separate Web-server software, server CGIs or plug-ins, and special HTML formatting commands. FileMaker Pro 4.0 makes sharing your information simple.

Other enhancements and changes to the application are fairly minor, although users who have been taking advantage of FileMaker Pro 3.0's relational capabilities will be pleased upon discovering that those capabilities have been somewhat refined in version 4.0. (For a look at the list of the cool features we *wish* were in this revision, check out the sidebar "Database Dreams: A FileMaker Wish List.")

Web Publishing Made Easy

When I first took a spin with an early beta of FileMaker Pro 4.0, it was hard to believe I wasn't using trusty old FileMaker Pro 3.0. The new version's new features are, if not exactly hidden, certainly tucked out of the way. That includes the commands for Web Companion, the new plug-in that enables the sharing of FileMaker 4.0 databases on the Web. (To learn how to get Web Companion up and running quickly, see the sidebar "Instant Web Publishing.")

With Web Companion, you are able to search, add, duplicate, update, and delete records via a Web browser. And since Web Companion turns every machine running FileMaker Pro 4.0 (including those running versions of FileMaker Pro for

HENK DAVISON

Windows 95 and NT) into a Web server, you don't need to buy and configure other Web-server software in order to share your databases.

Web Companion's instant Web publishing is easy to use, but the results aren't fancy. Your home page is a simple document featuring FileMaker logos and a list of open Web-enabled FileMaker databases on your machine. When you click on one of those database names, you go to a Web page that uses HTML to approximate what you'd see in the regular FileMaker application. If you're not satisfied with Web Companion's default home page, you can create a custom one, using any Web-page editor. Even Web novices should be able to get their information on the Web in just a few steps—a remarkable accomplishment.

Customizing Web Databases

But FileMaker Pro 4.0's new Web features aren't just for Web publishers who want the one-button approach. Like Lasso, on which Web Companion is based, the plug-in lets serious site designers create custom Web pages in their favorite HTML authoring program and link them to their FileMaker Pro databases by using CDML (Claris Dynamic Markup Language) tags. When you do this, you control the elements of your Web page's appearance, using HTML, and then add CDML tags that can insert database items into your HTML documents on the fly.

If you're already proficient in HTML, you'll find CDML simple to use. For example, setting the title of your HTML page as the contents of the Name field in your database requires this code: **<TITLE>[FMP-field: name]</TITLE>**. To make things even easier, Claris includes a database of available CDML commands with FileMaker Pro 4.0, as well as the CDML Tool, which allows you to drag and drop CDML tags from a special data-

Instant Web Publishing

Many Mac users hold the belief that well-designed applications don't need manuals, because people can figure out how to get a job done just by looking at a program's interface. In the case of FileMaker Pro 4.0, I wish those people the best of luck. Web Companion is simple, but intuitive it's not. True, you can become a Web database publisher after clicking on just a few check boxes—but first you've got to *find* those boxes. This step-by-step guide will help you.

1 You need a computer with a full-time Internet connection; since Web browsers need your IP address to access your database, a dynamic (changing) IP address won't do. If you're a home user who has no dedicated Internet connection, you'll find taking advantage of FileMaker's new Web publishing features difficult.

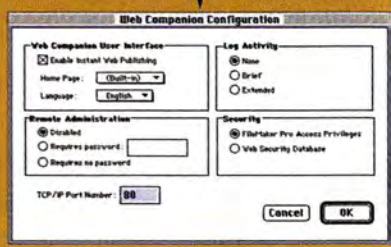
2 Prepare your database by choosing all the fields you want to publish on the Web, and create a layout that includes only those fields. There's no need to get fancy, however—styles, special backgrounds, and colors won't appear on the Web.

3 Select Preferences from the Edit menu. In the Application Preferences dialog box, choose Plug-Ins from the pop-up menu.

4 In the Plug-Ins window, click on the check box next to Web Companion to enable it. You can configure Web Companion from this window too, by highlighting Web Companion and clicking on the Configure button.

5 In the Web Companion Configuration window, you can choose the home page that will be displayed—either FileMaker's built-in home page or one you've designed. You can also set several other options here, including the TCP/IP port number (useful if you're running FileMaker on the same machine as regular Web-server software) and security features.







base so that you can insert tags quickly into your HTML documents (see the screen shot "Custom Designs"). Unfortunately, most graphical HTML editors currently are unable to handle CDML tags. Until they can, you'll be required to insert the tags into your HTML documents by using a text editor or Claris Home Page 3.0.

Of course, FileMaker Pro 4.0 doesn't just serve text—you can include various types of information in your databases, including images in such formats as GIF, JPEG, and animated GIF; QuickTime; AIFF audio; and Java-applet format. You can also store images in other graphic-file formats, such as PICT, TIFF, or EPS and have FileMaker convert them into JPEG images on the fly.

Safe and Sound

If you're thinking about making the information in your databases available over the Web, you should be concerned about security issues. FileMaker Pro 4.0 offers two ways to manage security: You can use the same FileMaker Pro access privileges you use when sharing databases over your local network, or you can utilize a new security database that allows you to set specific security instructions for Web-enabled databases. Neither option provides the level of security that is needed to reassure credit-card users, but either one is suitable for the prevention of simple breaking and entering.

To use FileMaker Pro access privileges, specify them as you would normally, via the File menu's Access Privileges command. Users of your databases will require the same password over the Web that they would if they were accessing the databases via the FileMaker application itself. The new Web-security database is a separate FileMaker database that offers finer control over security than the Access Privileges method, but at the cost of a little added complexity.

6 Although you've enabled Web Companion, users can't access your database across the Web just yet. From the File menu, select Sharing and click on the check box next to Web Companion. Your database is now accessible over the Web.

7 To choose which fields will appear on the Web, choose Preferences from the Edit menu and select Web Companion. In the Web Companion View Setup window, choose which view you want to work with from the top pop-up menu. Your choices are Table View, Form View, Search, and Sort.

Then choose a layout from the Layout pop-up menu. The list of fields displayed on that layout appear in the box below the pop-up menu. Note that the layout will not appear: You are simply selecting the fields that will appear.

8 Use the Sort option to establish whether records will appear in sorted form and whether users will be allowed to sort the records.

9 You can now view your database from your browser. Open your browser, and type in the IP address of your computer. (If you don't know your IP address, check your MacTCP or TCP/IP control panel.) Unless you've designed your own home page, you'll see a screen something like this one. Click on the name of your database to reach it.

10 Your database will look a lot like the photo album shown here—without the personal photos, of course. The screens in the browser will change to reflect features you've turned on or off. For example, if users are not allowed to add new records, the New Record button won't appear.

Your control over the database's appearance is otherwise extremely limited: You can't set the sizes of fields or rearrange them, although your layout design does have some effect. The fields appear in the order in which you placed them on your layout and at a similar size. Fields that were tiny in the original are also small in the browser. You have no control over the fonts that appear or over any styles. For that kind of control, you need to design templates yourself, using HTML and FileMaker's special CDML tags.





Database Dreams: A FileMaker Wish List

It doesn't matter whether we're professional developers or people who just keep track of our record collections in homegrown databases; we all have a couple of features we'd like to see added to FileMaker Pro. We asked developers and our own *Macworld* editors which features they'd particularly like to see Claris implement in a future version of FileMaker Pro, based on their experiences with version 3.0. Here's a compilation of the most-requested features and whether or not they made it into 4.0.

It's in There

1 Portal Sorting
No matter how you sort the data in a file, when you view it through a portal in another file, the records are presented in the order in which you created them, your custom-sort be damned. Every FileMaker user we talked to, it seems, requested portal sorting. With version 4.0, you can assign a sort order for records in portals via the Define Relationships dialog box.

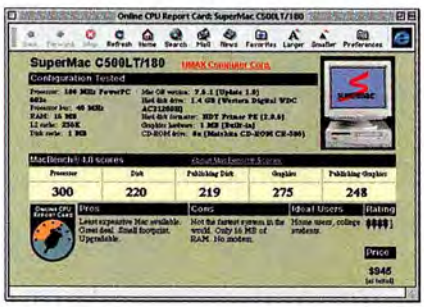
2 Out-of-Sight Files
Instead of presenting users with a sometimes-bewildering list of related files that are tagging along with the main database file, why not hide the subfiles? You can now hide related files in the Open Hosts (⌘-option-O) dialog box by adding a _ or _.fp3 suffix to file names. Files that have the new suffix still show up in the Open dialog box (⌘-O), however.

3 Plug-in Support
FileMaker Pro 4.0 opens the door to plug-in support—something enjoyed by users of Adobe Photoshop and QuarkXPress, among other programs—with Web Companion. We hope to see Claris support further innovative uses of plug-in technology in the months to come.

The Wait's Not Over

1 Editable Scripts
FileMaker supports drag and drop—so why don't FileMaker scripts? Even enabling copy and paste within ScriptMaker would save hours of tedious script building. Unfortunately, the top request we received isn't in FileMaker Pro 4.0.

2 Event-Aware Scripts
With previous versions, FileMaker scripts could run only when a user had clicked on a button or opened or closed a file. Our experts want scripts to be *event-aware* so that they can be run when particular fields are modified or when a user switches to a specific layout.



Custom Designs HTML designers can use CDML, the Claris Dynamic Markup Language, to create custom sites like this one that serve data from FileMaker Pro 4.0 databases.

Internet-Savvy for Everyone

Even if you *don't* want to post your databases on the Web, two new additions to FileMaker's scripting language, ScriptMaker, may still come in handy, letting your databases access the Internet.

With the Send Mail function, you can find a set of records and use a field in those records as the To: or CC: fields of outgoing e-mail messages. This option lets you perform mass and bulk mailings of e-mail directly from your FileMaker databases.

The other addition to ScriptMaker is the Open URL command, which allows FileMaker to communicate directly with Web, FTP, and e-mail applications via Apple events, instructing them to load Web pages, download files, or address e-mail messages from within ScriptMaker scripts. (To use either of these commands, Mac users must install Internet Config, a free utility downloadable from the Internet. You can get Internet Config from *Macworld*'s Software Library, at www.macdownload.com.)

Handy (but Minor) Extras

Considering that this is a major upgrade from version 3, veteran FileMaker Pro users may be disappointed at the small number of other features that made it into the latest edition of the application. Other than those in Web Companion, the majority of features new in version 4.0 are rather inconsequential.

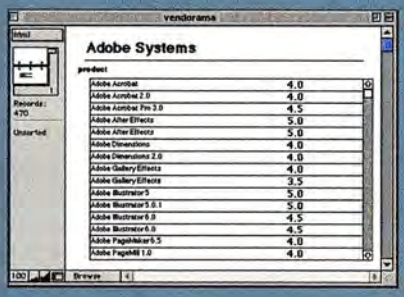
Sorting Portals The most exciting feature for relational-database users is the ability to sort portals, or views, into other databases. For example, if you've linked a customer list with an invoice database, you can now sort the invoices by customer name. This is a big deal, and it alone might make FileMaker Pro 4.0 worth the upgrade price for heavy users of FileMaker's relational features.

Drag-and-Drop Excel Microsoft Excel users will be happy to learn that they no longer need to save Excel files as tab-delimited text and manually create a new FileMaker database in order to import that data into FileMaker. Now, Excel conversion is as simple as dropping Excel files onto the FileMaker icon.

Define Command Anyone who has relied on FileMaker's value lists for generating pop-ups and radio buttons knows just how difficult it is to edit those lists—you have to enter Layout mode, use the Field Format command, and then choose the Define Value Lists pop-up. But thanks to a sensible interface change in FileMaker

3 Tear-off or Floating Palettes
If you've ever switched to Layout mode and had to resize the window to reach the layout tools, you've probably wondered why Claris hasn't moved those tools to tear-off or floating palettes. It makes sense, as does giving ScriptMaker the same treatment. Perhaps the company could take it a step further and create a Library palette filled with custom scripts, custom buttons, and other layout objects. Sounds like a great idea—maybe we'll see it in FileMaker Pro 5.0?—SUZANNE COURTEAU

Thanks to Matt Petrowsky, of ISO Productions, and Kirk Kerekes, Mark Rubenstein, Simon Slavin, and Martin Trautmann, of comp.sys.mac.databases.



Serial Portal FileMaker Pro 4.0 lets relational-database users automatically sort the items found in a portal window.

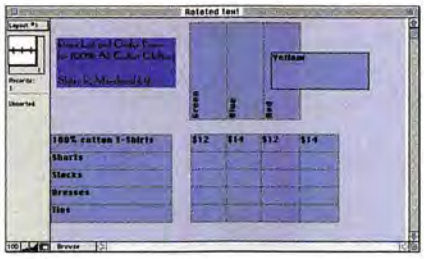
Pro 4.0, you can edit value lists via the File menu's new Define command. This command also enables you to define fields and relationships.

Rotated Text When you're in FileMaker's Layout mode, you can now rotate text and fields in 90-degree increments (see the screen shot "A New Angle"). When you click on a field to edit it, it appears in unrotated form.

Find Content Match In Find mode, you are now able to use the Find Content Match function to search for exact matches in fields. In previous versions, searching for *Smith* could result in finding records from *Smith* to *Smithers* to *Smithsonian*. You can now specify when you want to find only *Smith*.

Calculation Extension Claris has opened up FileMaker's calculation language to third-party add-ons, called external functions, via a plug-in interface. Web Companion adds external functions that enable you to retrieve the IP addresses of users who are accessing your databases and that allow you to convert text or field values to HTML. Although no details were available, Claris says that third-party external functions will be available in the future.

ScriptMaker Options ScriptMaker has been changed slightly in version 4.0, although not dramatically. The new Open category contains commands such as Open Define Value Lists and Open Application Preferences.



A New Angle FileMaker Pro 4.0 allows layout designers to rotate text fields.

Recently Opened Files A new item in General Preferences lets you add a list of recently opened files to the File menu. You can choose to list from one to nine files or turn the feature off entirely.

None of these changes are likely to dazzle users, but most are handy, practical tweaks. Still, it's too bad that Claris didn't take the opportunity to add features such as tear-off palettes and editable-script writing in this version. Options such as these aren't original or unique, but they sure would have made this upgrade seem more substantial.

The Last Word

If you're not currently publishing your databases on the Web but have a permanent Web connection, you can use FileMaker Pro 4.0 to share your information quickly. Small businesses, home users, and workgroups who don't want to put a lot of effort into designing a Web site can post data on the Web quickly and with minimal hassle.

If you've wanted to publish your databases on the Web but were afraid it would be too complicated, using Web Companion's instant Web publishing features is the answer. For more-complex database-publishing tasks, the Lasso-based features new in FileMaker Pro 4.0 are powerful enough to create attractive and detailed databases on the Web.

If you're already publishing your FileMaker databases on the Web, you'll probably find that this new version won't add enough to make you want to revamp your system, although you should probably consider upgrading to it for development in the future.

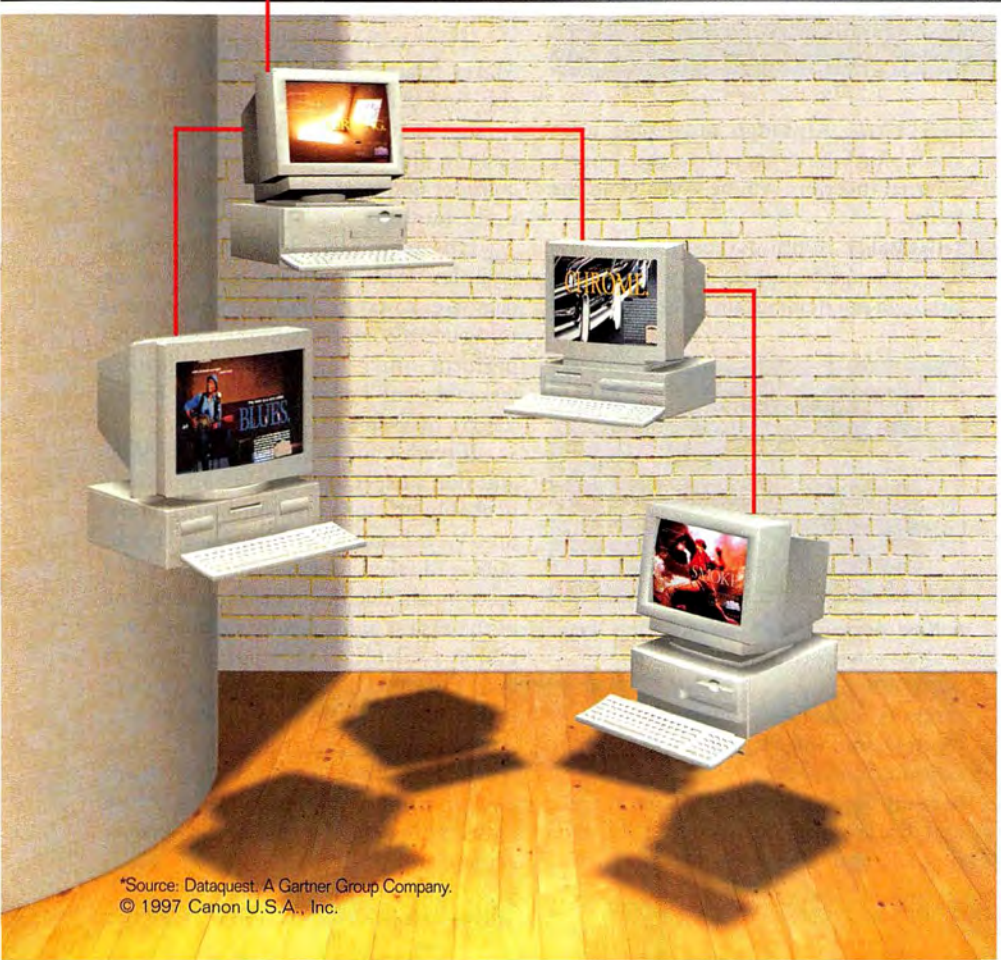
However, users looking to create complex Web applications, link their databases to Java applets, use encryption to secure the contents of their sites, and perform other higher-end publishing tasks may still be better served by Lasso, Tango, or Web FM.

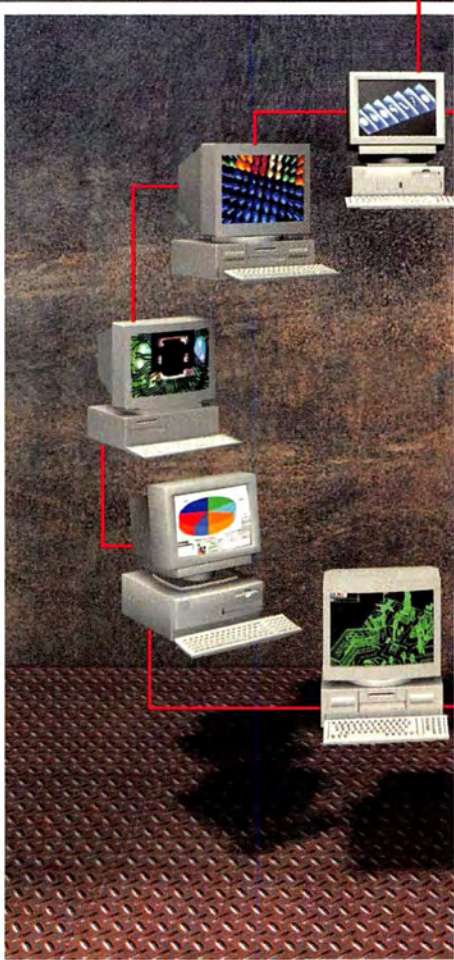
If you're not publishing on the Web and don't expect to be, this upgrade is probably not for you. None of the new non-Web features are to-die-for knockouts, and taken together, they don't add up to much. FileMaker has long been one of the easiest, most flexible database programs available. This upgrade doesn't take any steps backward, but it doesn't make a giant leap forward either. **m**

WENDY SHARP, coauthor of *Macs for Kids and Parents*, stores all of her information, from addresses to invoices to photographs, in FileMaker Pro databases.

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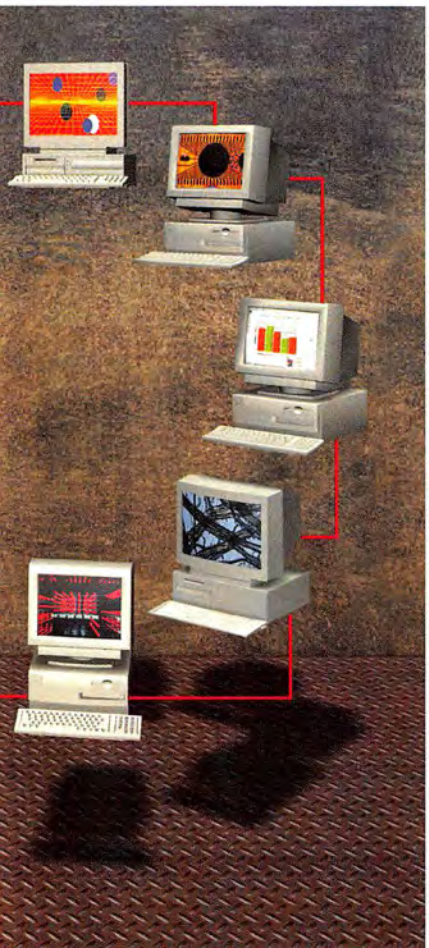
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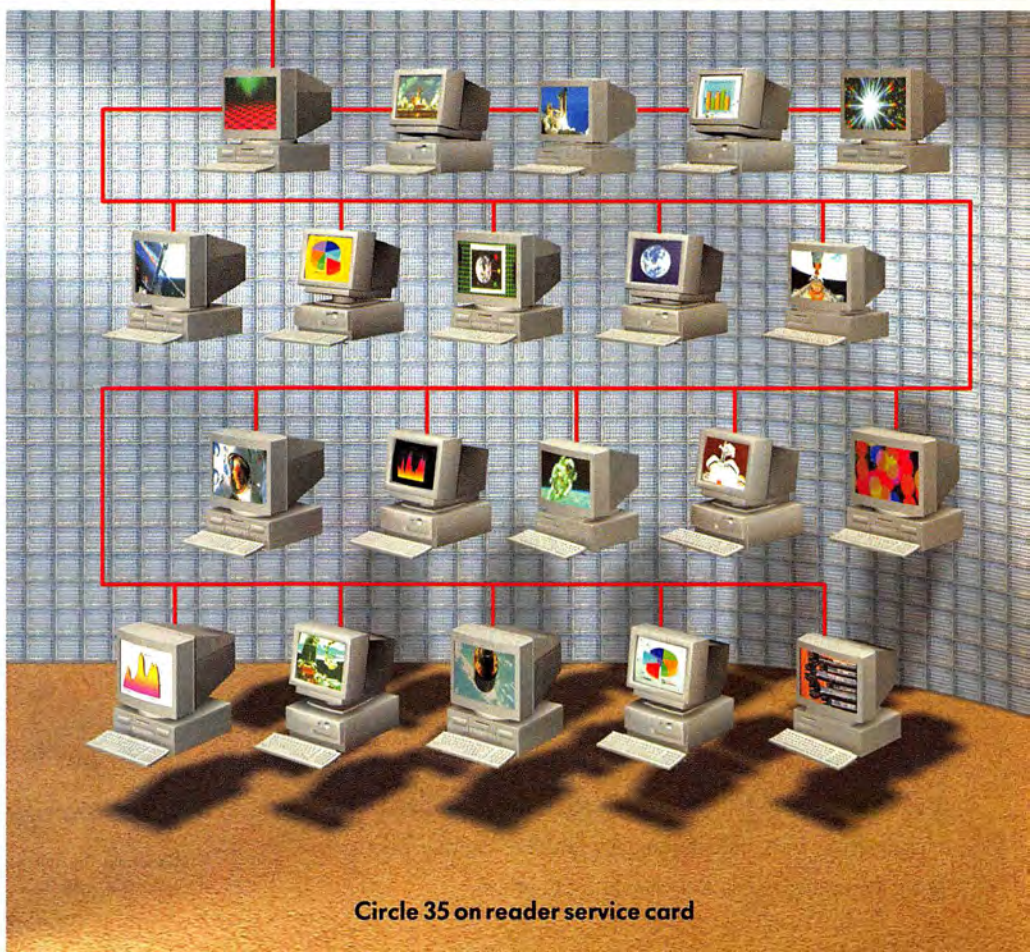
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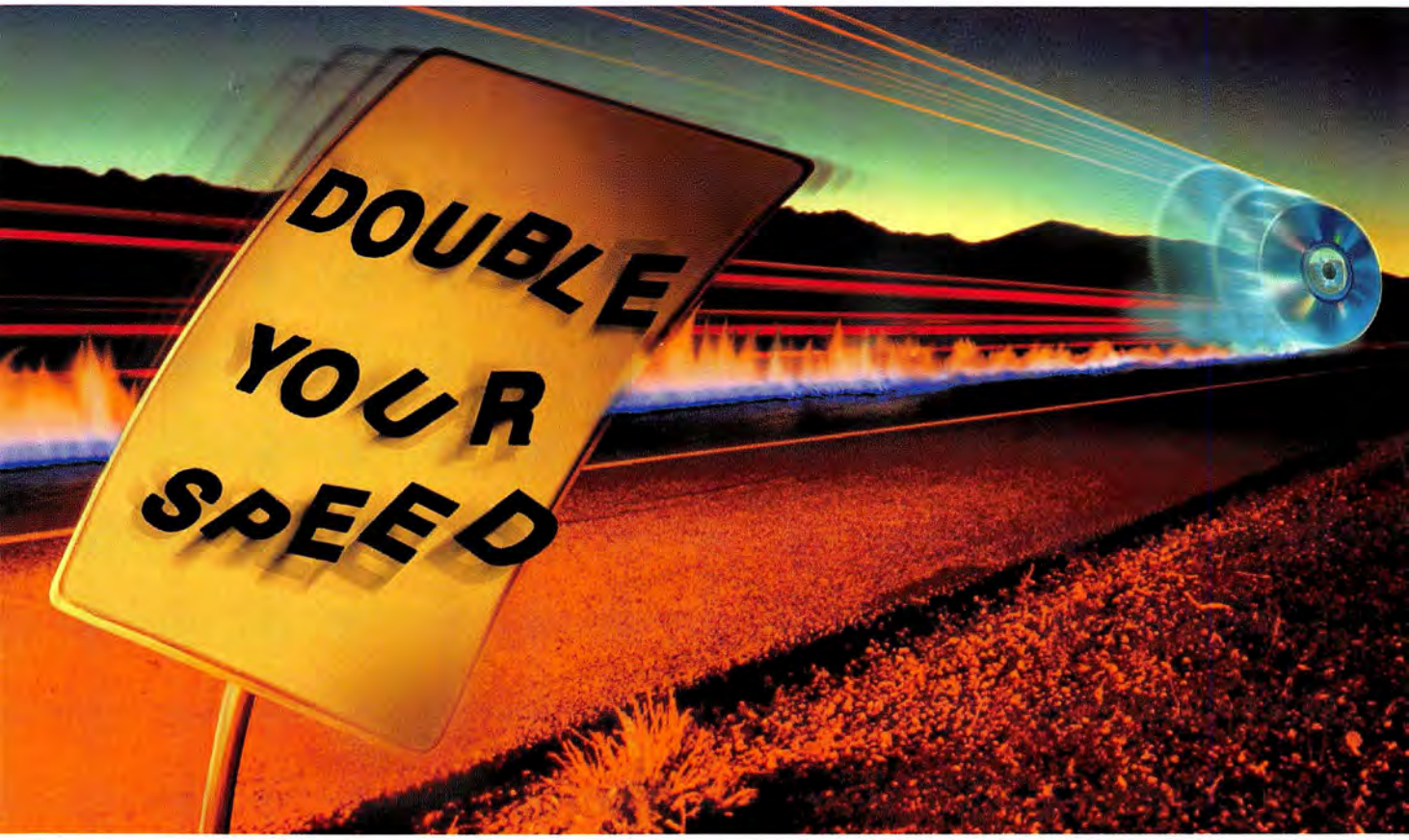
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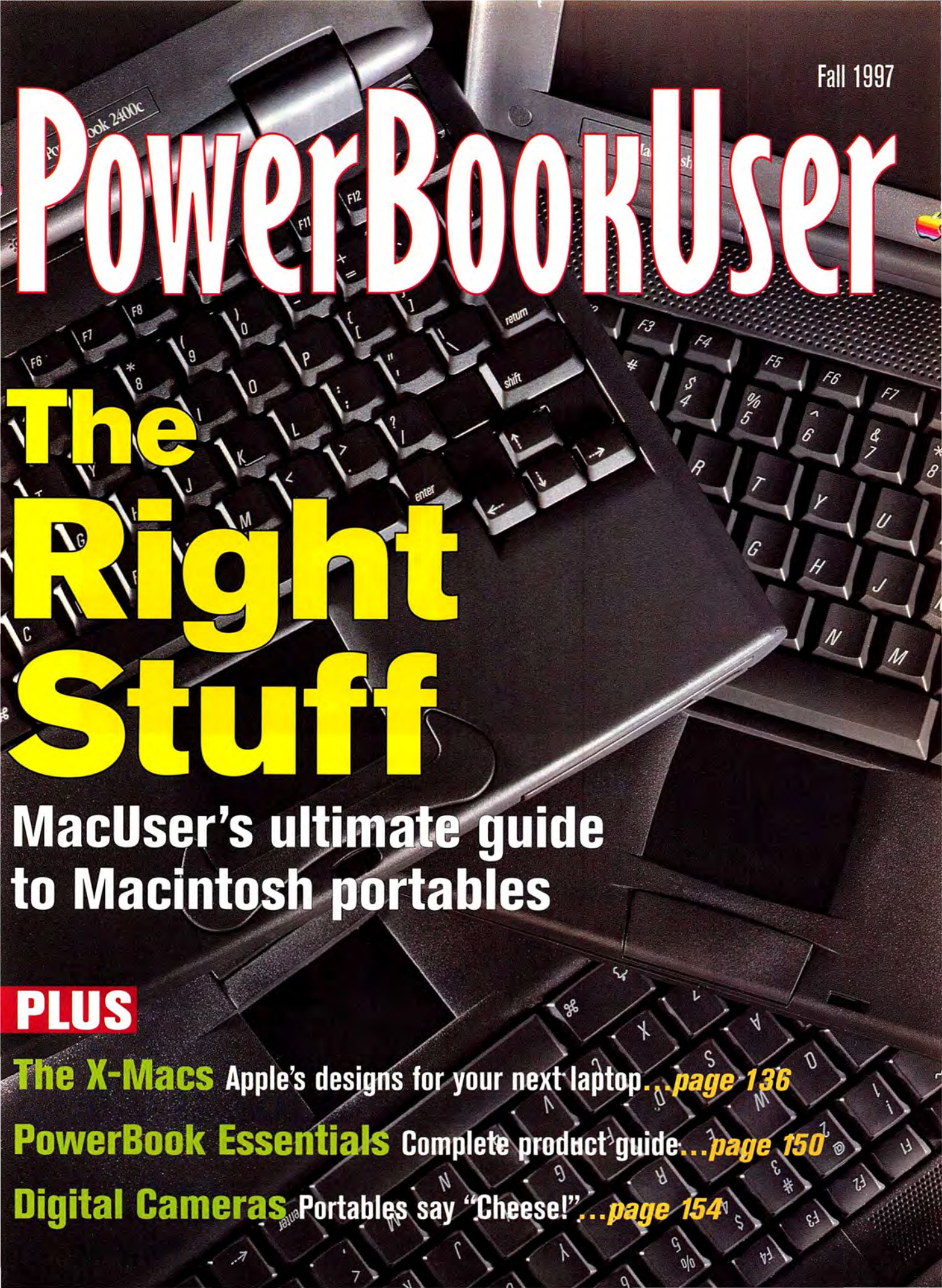


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Fall 1997

PowerBookUser

The Right Stuff

MacUser's ultimate guide to Macintosh portables

PLUS

The X-Macs Apple's designs for your next laptop...*page 136*

PowerBook Essentials Complete product guide...*page 150*

Digital Cameras Portables say "Cheese!"...*page 154*

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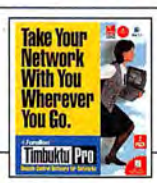


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PowerBookUser

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Andrew Gore declares that now is the time for Apple to make bold moves in PowerBook design — innovate or die!

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FEATURES

Serious Curves Ahead

Some PowerBooks of late have looked like the Wagon Queen Family Truckster, but these racy new concept models would be fit for Fitipaldi. Apple's Industrial Design Group shows us how form meets function in these far-out designs of the (hopefully) not-too-distant future. BY ANDREW GORE · 136

Which PowerBook?

MacUser LABS Whether you like your PowerBook built for comfort or built for speed, there's a potent portable for you among this Cupertino trio — the 1400c, the 2400c, and the 3400c. We rate the configurations of the various PowerBook series to help you determine which is best for you — whoever you may be. BY HENRY NORR · 138

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PowerUser

If you're a truly mobile Mac user, you're often changing venues, but you needn't constantly tweak system configurations. Apple Location Manager lets you establish clusters of system settings — one for every place you hang your hat — that you can select with a single click. **By Jim Shatz-Akin** · 147

The PowerBook Compendium: A Directory of Everything PowerBook

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COVER STORY Whether you like your mobile Macs thin and racy or stout and sensible, our "Which PowerBook?" buyers guide will help you find the perfect match. · **138**

COVER PHOTO Michael Falconer

For one-click access to *PowerBookUser*, go to www.macuser.com/pbu

BY ANDREW GORE

Playing It Safe

Now that PowerBooks are finally on the road again, it's time for Apple to take some risks

WELCOME TO THE PREMIER issue of *PowerBookUser*, the ultimate resource for Mac users who'd rather do it on the road. Inside, you'll find information about the latest mobile-Mac products. You'll also find our PowerBook shoot-out, which compares and rates every shipping PowerBook model; a guide to getting the most from Apple Location Manager; the complete and up-to-date PowerBook-product compendium; plus a few special surprises.

We created *PowerBookUser* as much to celebrate the comeback of the best mobile-computing platform as to deliver a much needed resource for users of that platform. The PowerBook isn't just a battery-operated Macintosh; it's uniquely designed to be the best possible portable for people whose office walls are the airframe of a jetliner, the interior of a hotel room, or the wide open spaces. From being the first portable with an active-matrix display, palm rests, and a centered trackball to being the first to incorporate stereo speakers, a subwoofer, a trackpad, expansion bays, intelligent batteries, and a 200-MHz-plus processor, what makes the PowerBook better is what has made it different from look-alike, work-alike Wintel notebooks.

It was a return to real innovation that brought the PowerBook back after the 5300 debacle almost killed it. Now, only by taking aggressive, intelligent risks can Apple keep this hard-won momentum going.

Designs Like Us. For a peek at what the future may hold, check out our photo essay, "Serious Curves Ahead." Here are some great examples of designs that don't just look good but also add functionality. Hopefully, these machines show that PowerBook designs will get back to where they once were — form *with* function.

Photography • Chloe Atkins



Apple has made tremendous progress in the last year. With entry-level, high-end, and sub-notebook portables now shipping, the company has rebuilt a solid mobile-Mac foundation. However, this is not enough. If Apple is to again become a leader in mobile computing, it must take chances. If machines such as the thin-line portable on our cover offer nothing more than tantalizing glimpses at what might have been, then Apple will lose the foothold it has grabbed. (The thin-line design gets our vote for the PowerBook we'd most like to own.)

Innovation can't just be about clever design, however; it must also be about breaking new ground with built-in capabilities. With the arrival of the VST Zip 100 expansion module, for example, Apple could be the first portable vendor to ship Zip drives inside its notebooks. This kind of innovation is easy to add — it takes just one phone call from Apple to VST.

License Now! Apple must also authorize PowerBook clones. With a dozen PC companies to compete with, Apple can't possibly win its way back to the top of the notebook heap alone. I can understand the bean counters' desire for Apple to keep the PowerBook business for itself. But what good will it do the company to make a few more bucks if the Mac platform continues to lose customers to the Wintel world because they can't get a mobile Mac with the features they need? Besides, we hard-core PowerBook fans are just big enough show-offs to pay extra for those beautiful industrial designs — hint, hint.

Apple, so far you've done a good job bringing the PowerBook back from the dead. Now it's time to do a great job moving it forward once again.

PowerBookUser

A SUPPLEMENT TO MACWORLD

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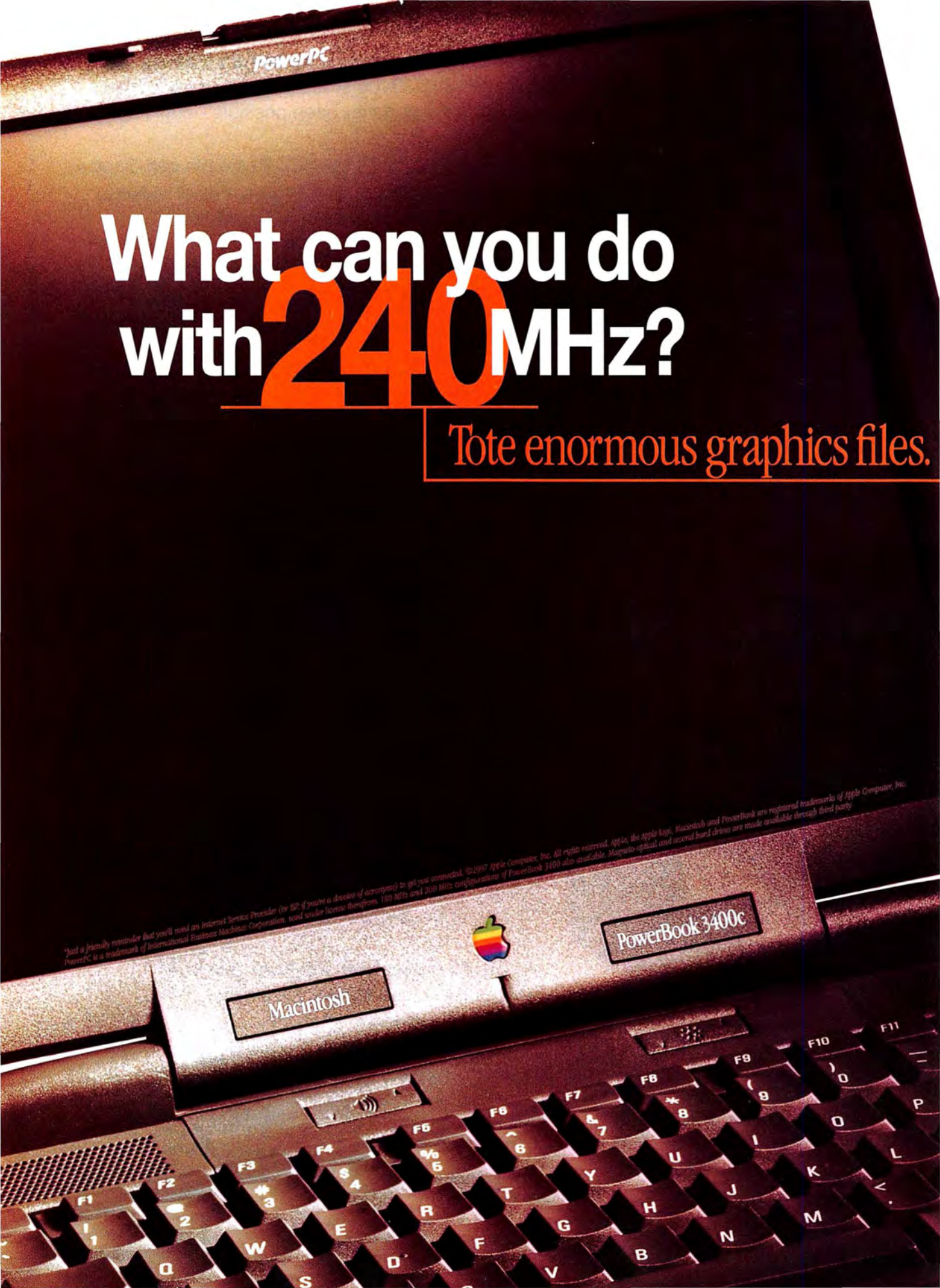
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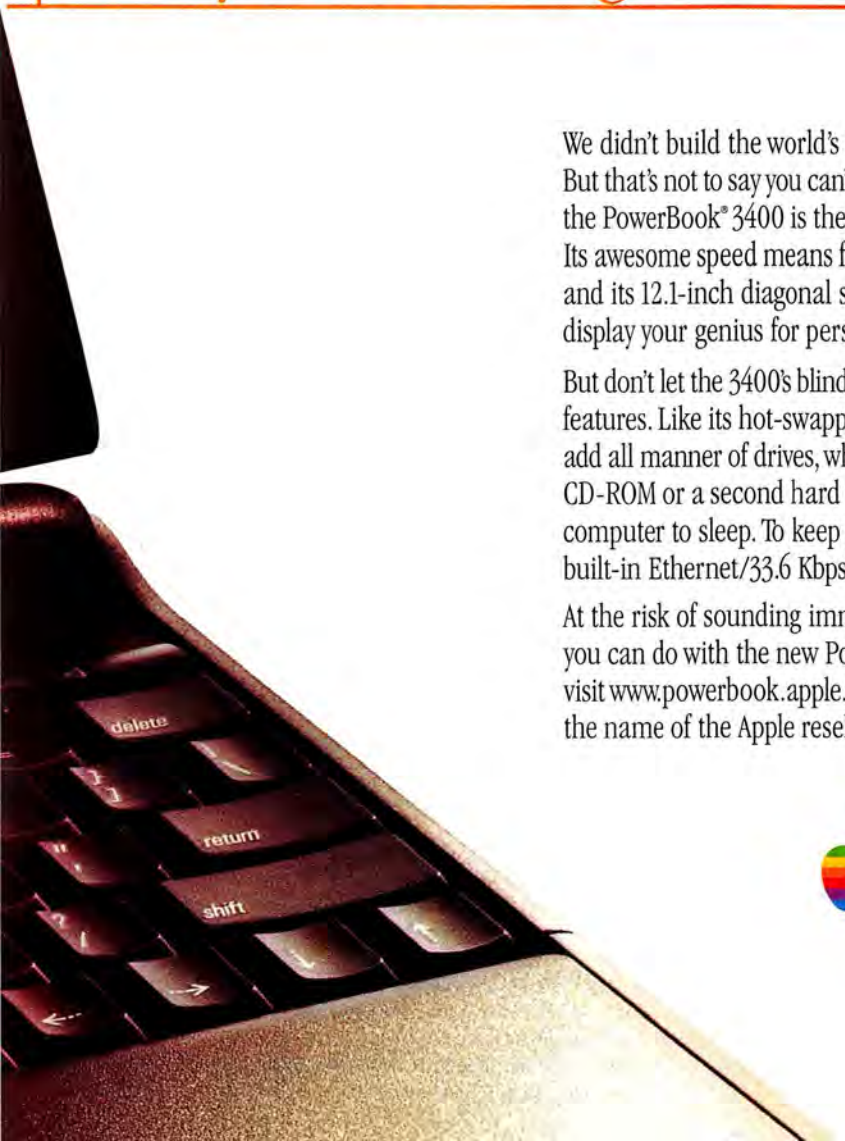
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At the risk of sounding immodest, there's no end to what you can do with the new PowerBook 3400. To learn more, visit www.powerbook.apple.com. Or call 800-538-9696 for the name of the Apple reseller nearest you.

News Analysis

Where Are All the Clone PowerBooks?

Apple foot-dragging has kept the lucrative mobile-Mac market closed to competition — but not for much longer

THREE FULL YEARS AFTER publicly committing itself to licensing the Mac OS, Apple remains the only vendor supplying laptops that run the system.

To help the clone industry get off the ground, Apple made many of its own PowerPC desktop-hardware designs available to its licensees. But despite repeated requests from most of these pioneer Mac-clone makers, Apple has refused to let anyone else build variations on its PowerBook designs, citing the high degree of hardware/software integration that characterizes notebooks and the extensive engineering support clone makers would require.

CHRP, or the Common Hardware Reference Platform, was a specification announced in late 1994 by Apple, IBM, and Motorola in order to make it possible for other manufacturers to build Mac OS-compatible systems without having to license Apple designs. The CHRP document describes requirements for a Mac OS-compatible laptop, but it leaves some important technical questions unanswered. In particular, it doesn't define standards for power management.

Pending the emergence of a common standard in this area, makers of Mac OS-compatible mobile systems will have to come up with their own solutions to the problem, and Apple's three leading licensees — Motorola, Power Computing, and UMAX — have all announced their intention to do just that. Apple, however, has always displayed a certain amount of ambivalence about CHRP, and this past spring, as the company was attempting to restructure its licensing program, officials said they had not decided whether they would grant Mac OS licenses for CHRP laptops.



Recent rumors suggest that Apple has now agreed, as part of a larger settlement with its licensees, to authorize laptop clones. But at this writing, no agreements had been announced and no clone laptops were expected before late this year.

Assuming they do arrive at some point over the next year, what will clone laptops offer that Apple's PowerBooks do not? It's too early to tell for sure, of course, but judging by what has happened in the desktop-hardware world, it's a safe guess that clone makers will attempt to deliver more performance at lower prices than Apple's. The new technologies we may see include DVD players; FireWire and Universal Serial Bus connectors; 3-D-graphics acceleration; and, of course, the latest PowerPC processors.

Whatever technical advances they may bring, the arrival of mobile clones will increase the range of choices available to mobile Mac OS users. Today, even with Apple offering three PowerBook lines, choices remain limited: If you want a Mac OS subnotebook, for example, there's only one option, with a minuscule keyboard and relatively high price. Likewise, if you want a 240-MHz processor, the notebook has to be a 3400c/240. If you don't like trackpads, you're out of luck, because that's all Apple offers.

In the Wintel world, by contrast, intense competition doesn't necessarily yield much real innovation, but within the framework of current standards, it does produce plenty of choice. If you're willing to shop around, you can probably find some vendor providing precisely the combination of features and technologies — processor, disk, screen, pointing device, battery, and the like — you're after. And you'll find some designs that haven't yet appeared in Apple's lineup — 2-pound subsubnotebooks, for example, and full-featured 7-pound systems that can instantaneously molt into sleek 4-pound subnotebooks.

CHRP alone won't bring the same degree of choice to the Mac platform — it takes a huge market as well as multiple suppliers to support all those options. But assuming that Apple doesn't renege on licensing CHRP laptops, Mac OS users should soon have many more alternatives in the mobile arena than they do today.

· *Henry Norr*

Illustration • John Ueland

Maximum Overdrive · *Andrew Gore*

Arthur to Crown 2400c Upgrade

The PowerBook 2400c is still dripping wet from the Lake of New Technologies, and already Newer Technology is preparing a better Excalibur with which to arm the subnotebook.

Called the NUpowr 2400 Pro, the Newer CPU upgrade card will sport either a 200-MHz or a 250-MHz PowerPC 750 G3 processor, code-named Arthur. More important, the card will also support either a 256K or a 512K Level 2 backside cache with a 2:1 bus-speed ratio. The combination of G3 chip and backside cache will not only make a NUpowr 2400 Pro-equipped 2400c the fastest portable on earth but such a PowerBook will also be faster than most desktop machines on the market. Newer expected to ship the NUpowr 2400 Pro in late September.



Newer also recently announced the NUpowr 500/183c, a 183-MHz 603e processor card with a 128K L2 cache, for the venerable PowerBook 500 series. The card will increase the speed of the 25-MHz 68040-based PowerBook by over 500 percent, the company said.

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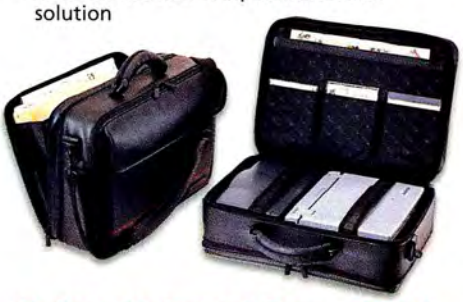
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BayWatch · *Rik Myslewski*

VST Delivers Stuff to Stuff Your Bay

There's a lot more for the PowerBook expansion bay than CD-ROM and floppy drives

THE POWERBOOK isn't perfect. It's not easy to back up its hard disk, for example: You can either do the floppy-swapping dance with a tall pile of disks or hook your 'Book up to the local network and slowly siphon files to another Mac or a server. Nor is it easy to supplement your PowerBook's internal drive: You have to lug around a semiportable SCSI drive — after you remember where you stashed that HDI-30 SCSI adapter. And, of course, no PowerBook is as portable as we'd all like it to be: For a trip of any length, you have to lug around an appropriately named power "brick."

Although Apple doesn't offer much in the way of options that can solve these problems, there's one company that's got the solutions: VST Technologies. Despite being buffeted by Apple's PowerBook mis-

Photography · Adrian Ordenana



Can't fit all your files on your PowerBook's internal disk? Need to quickly swap tons of data with coworkers? Hot-swap a 1.4-, 1.6-, or 2-GB hard drive into your expansion bay.

steps of the past (see the "VST: Back from the Edge" sidebar), VST is still around and is offering a range of products — including batteries, chargers, and cigarette-lighter power adapters — designed to improve your mobile-Mac experience.

Central to VST's mission is its line of products designed to fit into the expansion bays — the slots into which the floppy or CD-ROM drive slides — of the PowerBook 5300/190 and the 1400 and 3400 series.

In our opinion, the most useful member of the VST expansion-bay family is also the newest one: the $349 VST Zip 100 Drive. Available for all three expansion-bay-equipped PowerBook lines, beginning on September 10, this slim Iomega Zip drive uses standard Zip cartridges and



PowerBook 3400s are clunky enough — but you can pack one less dongle by using an internal AC/DC power adapter instead of a power brick.

offers road warriors the standard Zip experience: rugged and convenient storage and backup on 100-MB cartridges.

VST has also offered an additional removable-storage module since April 1996: a $499 magneto-optical (MO) drive capable of reading from and writing to inexpensive 128- and 230-MB optical discs. Although MO drives have never really caught on in the U.S. — they're huge in Japan — you may decide that their larger capacity makes up for their relative scarcity stateside.

If you want the ultimate in extra storage or backup security, however, you might want to pop for a VST Expansion Bay Hard Drive ($599 to $619). Available with a capacity of 1.4, 1.6, or 2 GB and benefiting from high-speed DMA, an expansion-bay hard drive is great not only for personal use but also for sharing data within a workgroup.

Finally, VST has a solution to one of our primary PowerBook pet peeves: that always annoying power brick. The $279 Expansion Bay AC/DC Power Adapter 3400 slips into your PowerBook 3400's



Equip your PowerBook with an Iomega Zip drive or a 128/230-MB magneto-optical drive, and you'll not only have backup but also a way to share those fat multimedia files.

expansion bay (how did you guess?), where it serves as a brick-free power source and battery charger. What's more, it can also draw power from an automobile cigarette-lighter socket. If you're the owner of a PowerBook 5300/190 or a PowerBook in the 1400 series, however, you're out of luck: VST offers the Power Adapter only for the 3400.

VST's line is impressive — but why isn't it available from Apple? Normally we'd suggest that you give Apple's CEO a call to try to convince that exalted personage to enter into immediate licensing negotiations with VST. The problem is that, as we go to press, there's nobody answering that particular phone. That's probably just as well, since it's nice to know nobody's around to snag this "third-party opportunity" away from a loyal, longtime PowerBook developer.

VST: Back from the Edge

YOU THINK *you* were disappointed when the PowerBook 5300 turned out to be a turkey. How about the folks at VST Technologies, who had bet the farm on expansion-bay futures?

Ever since the introduction of the 500-series PowerBooks back in May 1994, VST had been waiting for Apple to get its expansion-bay act together. The 500 series, you may recall, was equipped with a PDS-based bay. However, the bay's tiny size made it impractical for anything other than a PC Card cage.

In late August 1995, the PowerBook 5300 series was introduced. Its fully realized (but still small) expansion bay was a big step forward, and VST was ready and waiting with an array of peripherals: three hard drives in November and a 230-MB magneto-optical drive the following April. However, VST's hopes — and its business plan — were shot to hell when early 5300s had to be recalled due to battery problems and when the entire series earned a reputation for poor reliability and erratic performance.

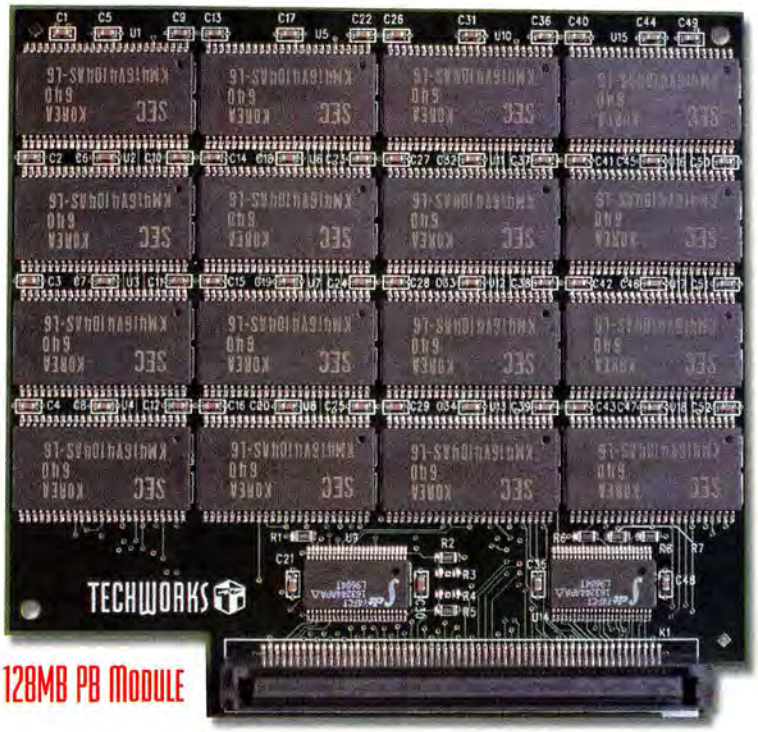
It was a long wait until the October 1996 introduction of the PowerBook 1400 series and then the arrival this year of the thoroughbred PowerBook 3400. Finally, it appears as if VST's faith in the mobile-Mac market may be rewarded. Both currently shipping all-in-one PowerBook lines have full-sized (5.5-inch) expansion bays, and VST has expansion-bay products ready for both portables — and also for the ill-fated 5300 and its 68LC040-based sibling, the PowerBook 190.

Let's just hope that good things come to those who survive. · *Rik Myslewski*

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Between the Lines · *Andrew Gore*

PowerBook Alumnus Returns to Alma Mater

Schiller to stress innovation in future PowerBook designs



Illustration • John Ueland

PHIL SCHILLER, marketing vice president for Apple desktop and server systems, recently took over PowerBook marketing, after the sudden departure of three key Apple mobile-computing executives. I sat down with Schiller to discuss his taking of the PowerBook reins and what the future holds for Mac OS portables.

AG: Phil, taking over responsibility for PowerBooks is a bit of a homecoming for you, isn't it?

PS: Sure. I started with the PowerBook team right after the 170 shipped. I worked on the 180, 160, 180c and 165, 165c, and then my favorite product — the PowerBook 500. Collectively, I've worked on PowerBooks longer than the people who just left the team.

AG: With your long experience with PowerBooks, can you tell us what you think made them successful?

PS: The PowerBooks grew out of the Macintosh Portable, which you wouldn't call a rousing success. The Portable was about being a no-compromise machine, but one of the compromises they didn't make was making it lighter.

So Apple responded by building some new portable lines with small clamshells. One became known as the all-in-one PowerBook line — the 100, the 140, and the 170. And then there was the subnotebook Duo.

At that time, the notebook market was so new that no one knew what people wanted. The 170 and the 140 were just incredible hits. That success highlighted two things: There was tremendous pent-up demand for portable Macs that were truly usable anywhere you go. The second was that it's important to take gambles on design.

The Duo came out later, and it innovated in areas such as docking. But by the time the Duo came out, it was clear that the subnotebook segment of the portables market was around 15 percent. And that's just because subnotebooks appeal to very sophisticated customers.

Then the PowerBook 500 arrived, with a simple goal: follow the tremendous success of the 170 and the 180 with a product to keep [170/180] customers happy.

AG: Overall, Apple had consistently stronger portables up to the 500. So what happened next?

PS: We got to the 5300, and frankly, I think we didn't listen to our customers. It tracked more with where the PC notebook business was going. That was the big mistake. Mac customers are not PC customers. They expect different things, better things. Apple also made quality decisions we shouldn't have. The quality wasn't there to make it a product that should have an Apple logo.

The net result [of the 5300's introduction] was a big dip in the PowerBook business. I know customers who left PowerBooks and went over to PC portables because they needed a product and we didn't have something to offer.

And then [management] did the absolute right thing. We got back to having machines in the three product categories we had before: the 3400, which breaks new ground in speed and has great communications integration; a good, solid product with the 1400; and a return to subnotebooks with the 2400.

AG: So how critical is the PowerBook to Apple's future?

PS: It's a critical piece financially. It's a critical piece to the whole solution. You cannot have a platform in the '90s that doesn't have a portable component to it.

AG: If portables are important to having a viable platform, isn't licensing Mac portables also critical?

PS: I am 100 percent in support of licensing portables to our clone makers, for a couple reasons: First, customers are asking for it. Second, it helps create more variety, availability, and competition.

I think the only issue is timing. Specifically, we need to extract control of power management. We don't want to create a scenario where different companies have different power-management schemes and it doesn't all work properly.

AG: In other words, if a licensee was to create its own power-management scheme and you came out with a new version of the OS, customers might not be able to install the new version on their clone, because it would disable power management.

PS: That's the risk — how to make sure that doesn't happen.

AG: Where do you see PowerBooks going from here?

PS: We need to move the industrial design ahead. We have finally started to let loose the industrial-design team to do the things they can do. It's one of the best Apple assets, and the least leveraged. We also need to continue moving ahead of the Wintel market with products that have tremendous performance, such as those that will be enabled by the G3 [Arthur] processors. And we need to start moving ahead again by integrating communications and other key features.

You know, there was a time when Mac customers would bring PC-using friends to their desks; show them their hot new machines; and say, "This is why I'm sticking with the Macintosh." It's about the product. Products such as the 5300 really didn't make you want to do that. We have to get it back to where the customer is the ultimate advocate for Apple.

Mac Stat · *Andrew Gore*

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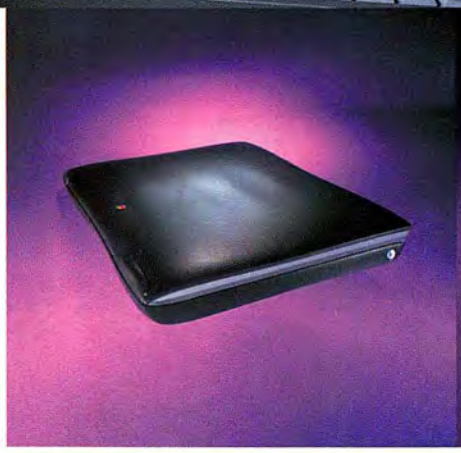
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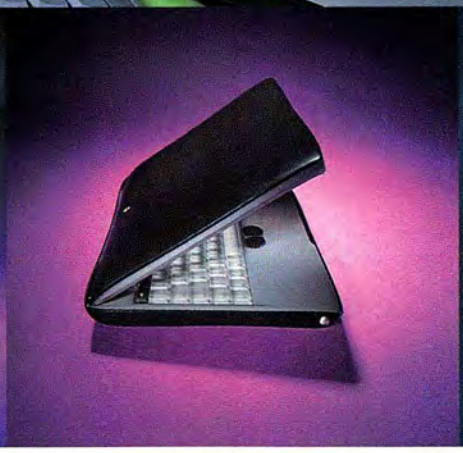
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SOMETIMES DRAMA *isn't about having a PowerBook with more gadgets than a Swiss-army knife. Sometimes simplicity speaks louder than the most clever engineering. Take, for example, this thin-line PowerBook model. Especially after the long lineage of rotund portable designs out of Apple, this razor-thin notebook makes for some welcome eye relief and still delivers a full complement of ports and even an expansion bay for a CD-ROM or DVD-ROM drive.*

A LOOK INSIDE *the thin-line PowerBook model reveals even-more-subtle innovation — a positively huge screen cradled in a thin frame, and a keyboard made from a composite of alternately colored plastics. Although it's unlikely Apple would ever ship a portable with a transparent keyboard (the scissors and springs in the keyboard mechanism would ruin the effect), colored plastics, such as the burgundy function keys in the picture above, are definite possibilities. Oh, and don't worry — Apple's not considering adding an IsoPoint in place of trackpads. This was done to demonstrate that PowerBook designs could accommodate all kinds of input devices — even something as retro as a ThinkPad belly button.*

THERE WAS A TIME *when the coolest thing about a PowerBook wasn't just its looks or nifty color screen but also all the wonderful toys that could be attached to it — like tin cans tied to a dog's tail. Apple is looking at ways to help facilitate a return of the dongle-happy days of the first PowerBooks — but with perhaps a bit less dangle. Witness these form-fitting speakers that plug into special sockets on either side of this model's chassis.*

BY ANDREW GORE

PowerBookUser Exclusive

Serious Curves Ahead

The future of the PowerBook is going to take some dramatic turns — and angles and colors and gadgets

ONCE UPON A TIME, the PowerBook was the most easily recognized computer in the world — not just because of the rainbow-colored fruit stamped in its plastic but also because of its distinctive chassis. PowerBook industrial design was heralded by all — even Wintel users — as the most revolutionary to ever come out of Silicon Valley.

Unfortunately, the years have not treated PowerBook design well. The decidedly PC-ish look of the 5300 series was only one of many sins embodied in that most reviled mobile Mac. Apple is only just now emerging from that frumpy downward spiral, and although the 1400 and 3400 weren't much better in the looks department, the recent arrival of the 2400c heralds the return of innovative design in the PowerBook.

Apple's world-renowned Industrial Design Group recently invited *PowerBookUser* to take an exclusive peek behind the scenes at two concept portables that demonstrate design ideals that may be part of future PowerBooks. For those who feel that even the 2400c's chassis is still a bit staid, take a look at these two machines — and be assured that we're only on the on-ramp to a road filled with some serious curves.



***GREAT PRODUCT DESIGN** isn't just about making something look good — it should also be about making it feel good. Especially with portable products, the tactile user interface is as important as the product's visual impact. In other words, it should be as easy and satisfying to handle as it is to look at. When designing these mouse-ear speakers, Apple decided to form them into a curved shape to fit perfectly in the palm of the user's hand. This not only makes them easy to handle but also helps prevent damage to the speakers due to being dropped. The speakers even snap together, making it harder to lose them in the bottom of a bag.*

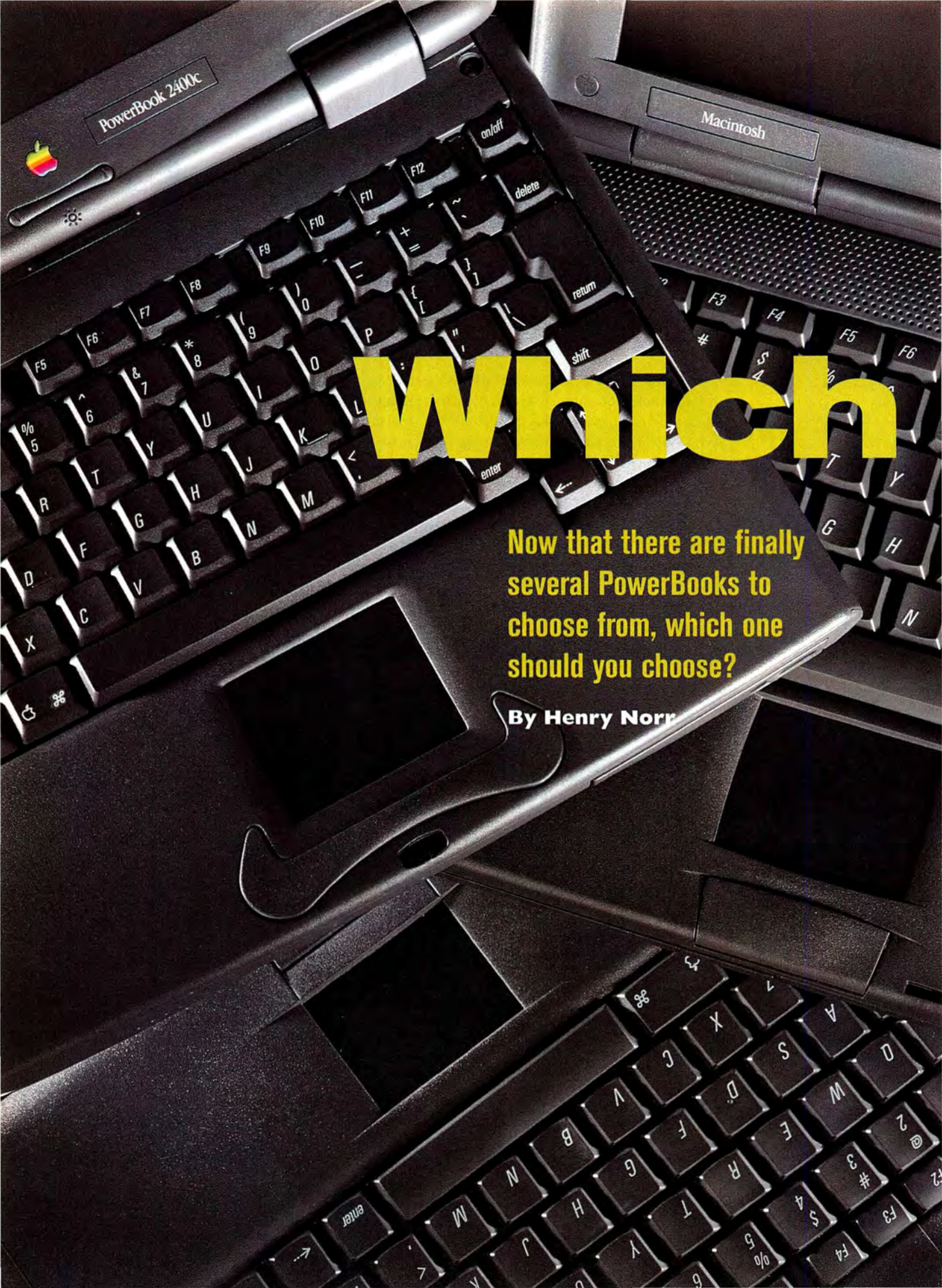


***ONE OF THE MODELS** Apple's Industrial Design Group showed us embodies several major innovations. For example, the keyboard, which is mounted where the screen normally goes in a traditional portable, comes with snap-lock hinges allowing the user to remove it. When the keyboard is liberated from the screen/CPU/storage module, it doesn't require wires to operate and instead relies on a wireless radio transceiver to communicate with the base station. This means users can operate their portable by remote control, even from behind the main module when using it for presentations.*



***THERE ARE TWO PROBLEMS** that all portable screens share — they're never big enough, and they don't let users switch resolutions on the fly. Members of the Industrial Design Group had both these challenges in mind when they sat down to design this model's display, and although they couldn't overcome the inherent inability of LCD screens to switch resolutions, they came up with the next-best thing — a huge, 14-inch active-matrix color screen that automatically switches orientation from landscape to portrait mode when the user pivots the portable.*

Photography • Lon Clark



Which

Now that there are finally several PowerBooks to choose from, which one should you choose?

By Henry Norr

MacUser LABS

LESS THAN A YEAR AGO, the question about PowerBooks was not *which* model to buy, but *whether* — or at least *when* — Apple could deliver even one model worth buying.

Fortunately, times have changed. Today the company offers not one, not two, but three PowerBook designs, with multiple configurations available in two of the lines. And they all work pretty much as advertised — the random crashes, fragile hinges, and countless other problems that plagued the disastrous 5300 series are now little more than a bad memory.

PowerBook?

The turnaround is obviously good news for anyone who wants a mobile Mac. But the proliferation of appealing PowerBooks does pose a new challenge: how to choose the model and configuration that make the most sense for you. If you've been paying even casual attention to Apple's announcements, you probably know the basics: The 1400 is the most affordable of the current PowerBook lineup, the 3400 is the fastest and most expensive, and the new 2400 is the smallest and lightest.

In some cases, this may be all you need to know to make your choice. If, for example, maximum performance is your prime concern and money is no object, you'll obviously want a 3400 with the fastest processor available.

But for most of us, the choice is more complicated. We want all the performance we can get, but our budgets are limited; we'd love an extralarge screen and multimedia support, but we're concerned about weight; or we'd love a lightweight — provided that the keyboard is big enough to let us work quickly and comfortably. The aim of this article is to provide a road map through the thicket of trade-offs you may need to make when purchasing your next mobile Mac.

Take It from the Top

We've sung the virtues of the PowerBook 3400 before (see "Rocketbook," April '97, page 54), and nothing we've seen in the six months since then has caused us to change our tune. It's still the fastest laptop in the land: Even the slowest version is almost twice as fast as the most recent PowerBook 1400, and when you compare it with any of the 1400's predecessors, the gap is all the more dramatic.

In fact, the 3400 gives most Mac OS desktop systems, except the very latest, a run for their money. It's not just the 3400's speedy CPU (current models contain a PowerPC 603e processor running at 180, 200, or 240 MHz). Equally critical are other improvements that finally let the PowerPC come into its own, including a PCI-based architecture; a 40-MHz, 64-bit system bus; a 256K Level 2 cache; and onboard graphics acceleration.

Combine all that with a bright, crisp, 12.1-inch-diagonal active-matrix screen; a full-sized keyboard; a tap-and-drag trackpad; a nifty internal communications card that functions as either a 33.6-kbps modem or a 10BASE-T Ethernet adapter (or even both at once); a removable CD-ROM drive (8x or 12x); a lithium-ion battery that lasts two to four hours (for real) per charge; and bundled copies of the Apple Internet Connection Kit, Claris Organizer, and ClarisWorks — and you've got one terrifically usable system. If there's something else you need, a full complement of ports (including GeoPort, SCSI, and Apple Desktop Bus), slots for two Type II or one Type III PC Card, and a versatile expansion bay should make it easy to add on. And aside from some early, now fixed problems with memory modules not staying seated, we've heard of no reliability problems with the 3400.

Not that we can't think of things we'd like to see improved. At 7.2 pounds (with the floppy drive installed — the CD-ROM drive takes it up to 7.4 pounds), the 3400 quickly makes its weight felt. Four built-in speakers add to the weight yet don't do much for sound quality. Two of these speakers are located on the back of the screen, where they create an odd bulge and increase the height of the system (when it's closed) to a bulky 2.5 inches. Overall, the 3400 is, at best, ho-hum in terms of industrial design.

Also on our gripe list: The internal IDE drives Apple ships are slow. The infrared port finally supports the industry-standard IrDA (Infrared Data Association) specification, but only at 1.2 Mbps and not at the 4 Mbps PC vendors are moving to. You're limited to "thousands" of colors on the built-in 800-x-600-pixel screen, and although there's an SVGA connector on the back, there's no true dual-monitor support: Either the external monitor mirrors the contents of the built-in one or the latter is disabled.

For most users, however, these are no more than minor annoyances; the only real problem with the 3400 is that it costs a bundle. The top-of-the-line configuration, with a 240-MHz CPU and a 12x CD-ROM drive, currently goes for a budget-busting

Photography • Michael Falconer

$5,500 (or close to it), even at discount resellers.

But street prices drop to just under $4,000 if you'll settle for a 180-MHz processor. You won't enjoy quite as much status among the megahertz-obsessed, but you'll still get most of the same performance benefits, since the 200- and 240-MHz configurations rank only a little higher than their slower sibling on our MacBench 4.0 Processor test.

You'll almost certainly want to add a few hundred extra dollars to the budget for more RAM, because Apple currently ships only a barely usable 16 MB in all 3400 configurations.

Of course, there are always a lucky few who can afford to plunk down five or six grand just to indulge a need for speed. Many corporate buyers also seem willing to pay such prices to keep traveling execs happy or to help sales reps in the field wow new prospects with whizzy presentations. And if your work actually requires you to crunch giant spreadsheets, compile code, retouch scanned images, or perform other processor-intensive operations *on the road*, you might be able to make a case that the time a 3400 can save you will justify the extra cost.

But let's face it: If you're using a PowerBook the way most laptop owners do — that is, for e-mail, Web browsing, personal-information management, light word processing, and doing basic spreadsheet work — you probably don't need a machine of this caliber. That's especially true if you use a desktop Mac most of the time and the PowerBook only during forays into the field.

If you can't stop lusting for a 3400, though, here's an angle to consider: Depending on the nature of your work, the 3400 might be fast and flexible enough to replace your desktop system. That wouldn't make sense if you require full-sized PCI slots and drive bays or a high-resolution display or if you would benefit from the even greater processing power of the latest desktop systems. But for users who don't fall into those categories, a 3400 with an external keyboard and monitor added makes a delightful replacement for a desktop system. Considering what you'd save by not having two systems, you just might be able to convince your boss, your spouse, or your conscience that a 3400 is a bargain!

Mainstream Mobility

When the PowerBook 1400 debuted last fall, Mac users everywhere greeted it with enthusiasm, partly because it finally delivered a few features Wintel users had been enjoying for many months (such as a CD-ROM drive and an 11.3-inch screen) but mostly because it was sturdy and reliable (see "Road Test: The Apple PowerBook 1400," December '96, page 70). Such was the general relief in the wake of the 5300 fiasco that few users bothered to complain that the new model's speed, well, left your socks right where they were.

Over the last few months, Apple has taken several steps to improve the 1400's speed, boosting the CPU in the base configuration from 117 to 133 MHz, adding a 166-MHz model, and finally making an L2 cache (128K) standard in all configurations. But the whole 1400 family is still hobbled by a fundamental design limitation: Its system bus — the channel through which data and instructions move in and out of the CPU, RAM, and ROM — can handle only 32 bits at a time, compared to twice that in the newer PowerBooks and current desktop systems.

As a result, the move to faster versions of the 603e and even the addition of the L2 cache have produced only modest speed improvements. Even the new 166-MHz PowerBook 1400c is barely half as fast as the slowest 3400 and the 2400 on MacBench 4.0's Processor test, with scores on the Graphics and Disk tests equally underwhelming. In terms of speed, the various 1400 configurations are comparable to Apple's first-generation Power Macs, the 6100, 7100, and 8100, and that means they lag pretty far behind the pace set by today's ever faster desktop models.

How much of a problem is that? It all depends on what you intend to do with your PowerBook. If you expect to be touching up Adobe Photoshop files, recalculating giant Microsoft Excel spreadsheets, or playing MPEG movies, the 1400 is almost certainly not the machine for you. But few of us actually perform such demanding tasks on the road; most users spend their time in the kinds of applications Apple bundles (again, the Internet Connection Kit, Claris Organizer, and ClarisWorks), and for these purposes, the performance of the 1400 is perfectly adequate.

The same goes for other aspects of the 1400 design: It's not exactly exciting, but it's eminently usable. The dual-scan version of its 11.3-inch screen is a bit dim, but the active-matrix version, for only a few hundred dollars more, is very nice. The keyboard, essentially the same as the 3400's, is among the best Apple has offered in a laptop. At 6.6 pounds (or 6.9 pounds if you install the CD-ROM drive in place of the floppy drive), the system is lighter than the 3400, and its height when closed is a half an inch less,

Speeding Up Poky PowerBook Drives

THE 2400 AND 3400 PowerBooks offer more processing speed than all but the latest desktop models, but in disk speed, these mobile systems still lag behind their stationary cousins, principally because the 2.5-inch drives used in most notebooks are designed to minimize power use.

Is there anything you can do to speed up your PowerBook's storage performance? One approach is to use a RAM disk, a portion of main memory configured to look to the Mac OS like a hard disk. Since the system can read from and write to memory almost instantly, such virtual disks are far faster than the real thing.

To create a RAM disk, open the Memory control panel and click on the On button under RAM Disk. You'll probably also want to click on the Save on Shut Down check box so that the Mac will automatically write the contents of the RAM disk to your real disk before it shuts down. (Otherwise, the contents of the RAM disk will disappear whenever you shut down.) Use the slider in the lower right of the control-panel window to specify the size of the RAM disk you want to create. Then close the control panel and restart — voilà, a speedy new disk appears on your desktop.

RAM disks are extremely fast, but they do have their drawbacks: If you crash, any files you've saved there may disappear without a trace. And the memory you allocate to the RAM disk isn't available to the system for any other purpose.

An alternative approach that doesn't take up so much RAM yet offers some speed benefits in most applications is to increase the size of the disk cache via the Memory control panel. This cache (which is completely separate from the Level 1 and Level 2 RAM cache on the logic board) is a special repository in main memory (DRAM) where data read from the disk drive is copied. The next time the CPU needs that information, it will check the disk cache first; if it finds what it needs, it can retrieve the information from the cache much faster than from the disk.

Apple ships most Macs, including PowerBooks, with the disk cache at its

making the 1400 easier to fit in a backpack or briefcase. The standard nickel-metal-hydride battery doesn't always last as long as Apple claims, but in our tests, a charge lasted a minimum of an hour and 45 minutes, and with reasonable conservation efforts, you can make it last three to four hours.

Video-out and Ethernet are extra-cost options, but all the other standard ports are available and the PC Card slots support two Type II cards or one Type III card. Although the 1400's expansion bay doesn't accept modules designed for the 3400's bay, Apple offers the basics for the 1400 — a floppy drive and, in most configurations, a CD-ROM drive — and third-party vendors such as VST Technologies offer other options (see "BayWatch," elsewhere in *PowerBookUser*).

All in all, the 1400 remains a solid and appealing product. But considering its lackluster performance, it's only reasonable to expect that it would be priced well below the 3400. That's precisely where Apple seemed to be headed this past spring, when it reduced prices on the dual-scan 1400cs/117 to $1,700 without a CD-ROM drive and $2,000 with a CD-ROM drive.

Unfortunately, those configurations are now available only in education channels in the U.S. (unless you can find a reseller with a leftover unit in inventory) and the 1400 configurations that have taken their place in the lineup carry much higher prices. The least expensive is the $2,500 dual-scan 1400cs/133, which includes a CD-ROM drive. The 1400c/133, which is identical except for its active-matrix screen, is $3,000, and the new 1400c/166 is $3,500 — as much as the new 2400c and close to the cost of the least-expensive 3400, even though the 1400c/166 is barely half as fast as these models.

The bottom line on the 1400: Unless you can afford to spend $3,500 or more, it's the only Mac OS notebook you can get. If you can afford it, you'll probably be satisfied, because it's a sturdy system that does the job. But we can't recommend it with enthusiasm until Apple brings prices down into the $1,500 to $2,500 range, where they belong.

Big Things, Little Package

The new kid on the block is the PowerBook 2400c, the 4.4-pound wonder manufactured for Apple by IBM Japan (see "The Incredible Shrinking PowerBook," July '97, page 28). At 10.5 x 8.4 x 1.9 inches, it's not as svelte as Apple's previous subnotebooks, the

PowerBook 1400c



Pros: Reliable design. Good-sized color screen. Easy to upgrade.

Cons: Slow, even with faster processor options. Overpriced.

Rating: 1400c and cs/133 ♦♦♦
1400c/166 ♦♦½

PowerBook 2400c



Pros: Small and lightweight, yet still offers complete set of ports. Attractive industrial design. Nice screen. Fast!

Cons: Tiny keyboard takes getting used to. No PCI expansion slots.

Rating: ♦♦♦♦½

PowerBook 3400c



Pros: Big, beautiful screen. Vast expandability. Lots of extras. Fast!

Cons: Big, heavy, and not especially attractive. Inability to display 24-bit color may give graphics pros pause.

Rating: 3400c/180 ♦♦♦♦½
3400c/200 ♦♦♦♦
3400c/240 ♦♦♦½

minimum setting, 96K. Curiously, this out-of-the-box setting is not what Apple considers the "default" setting: If you click on the Use Defaults button, the cache will be set to a size equal to 32 times the number of megabytes of real RAM you have installed — on a Mac with 16 MB of RAM, for example, clicking on the button sets the disk cache to 512K.

Since *MacUser*'s policy is to test systems configured just as they are when customers take them out of the box, our MacBench 4.0 scores are usually recorded with the disk cache set to 96K. But increasing the cache to the default size by clicking on the Use Defaults button can significantly improve effective drive speed. If you can spare the RAM, making the cache even larger usually provides some additional improvement (see chart). In particular, an ample disk cache speeds up Mac OS 8's new multithreaded Finder.

Disk-Cache Size	*MacBench 4.0 Disk Score*
96K	80
256K	131
512K	158
1,024K	173
1,536K	178

These MacBench 4.0 Disk scores were recorded on a PowerBook 2400c running Mac OS 8 and show how setting a larger disk cache can improve speed.

Duos, nor as slim as IBM's own ThinkPad 560 line. But the 2400 is an almost full-featured system that imposes far fewer compromises than the Duos did: A full complement of ports comes standard, so without having to buy and carry around docking doodads, you can plug in SCSI and serial devices, an ADB mouse and keyboard, a floppy drive, external stereo speakers, and a large-screen monitor. There's no built-in floppy drive or expansion bay, but a 3-ounce external floppy drive comes with the system. As in the 3400, there's also an infrared port offering IrDA compatibility at up to 1.2 Mbps, and there are the two Type II PC Card slots or one Type III slot. (In the 2400, however, they're at the back of the unit.) Apple originally promised that the 2400's PC Card slots would have faster, 32-bit-CardBus support but has since recanted and now says it's unclear if there will be a software upgrade to get CardBus working on this model.

The bright, sharp active-matrix screen measures a relatively modest 10.4 inches diagonally, but its resolution (800 x 600 pixels) is the same as that of the 1400 and 3400 — in other words, you see just as much information, but it's all a bit smaller. Driving the screen is the same video controller as in the 3400 — you get snappy graphics acceleration and 16-bit color, but you also get only mirroring, not true dual-monitor support.

The 2400's PCI-based logic board is a compact derivative of the 3400's, with a 40-MHz, 64-bit system bus; a 256K L2 cache; and a 180-MHz 603e processor. Not surprisingly, therefore, 2400 speed is similar to that of the 3400c/180. (The 2400 unit we tested did slightly better on MacBench 4.0's Processor and Disk tests but worse on the Graphics and Lo-Res Publishing Graphics tests.) That's a lot of of speed — we even fired up Microsoft Word 6.0.1 and Excel 5.0 on our test system, and both launched fairly quickly (15 seconds for Word, 8 seconds for Excel) and worked well.

Although the 3400 is also available with 200- and 240-MHz processors, the 2400, at least for now, is limited to 180 MHz. (Unlike the 3400's, the 2400's CPU is upgradable, however — see "Arthur to Crown 2400c Upgrade," elsewhere in *PowerBookUser*.) But if you're otherwise tempted by this lightweight, don't worry much about that — the extra clock cycles on the high-end 3400s elevate the price tag a lot more than they do actual speed.

We found only two significant issues with the 2400. The first problem is the absence of a CD-ROM option — we weren't surprised that there's no place to install a CD-ROM drive internally in the 2400's compact case, but we were sorry to discover that Apple won't offer an external SCSI drive with the system, even as an extra-cost option. As with the 1400, however, you can solve that problem with an external drive: Any standard SCSI external drive should work, as long as you have a PowerBook SCSI cable or adapter and driver software. If you want to take a CD-ROM drive on the road, you'll probably want to get a lightweight portable one, such as the 6x Sony CD-ROM DiscMan, which is about $300.

The problem that may be harder to solve is the keyboard. In a word, it's *small*. To pack all the standard keys — including arrow

PowerBook 2400c Wins Wake-up Shoot-out

IT'S AN EXPERIENCE almost every laptop user has had: You have only a few minutes to check your mail before you have to step into your next meeting or leave for the airport. Or your boss calls and asks for some information you've salted away on your notebook's hard disk. You fire up your mobile Mac, with its state-of-the-art RISC processor running at a clock speed unheard of two years ago. Then you wait. And wait. And wait.

In such situations, the time it takes to boot up your machine, or even just to wake it from sleep, may be more important to you than how fast it can crunch data when it's already up and running.

To see how today's PowerBooks compared in this regard, we clocked boot-up and wake-up times on four current models — a 1400c/133, 1400c/166, 2400c/180, and 3400c/240 — running Mac OS 8, plus a 1400cs/117 running System 7.5.5. Some of our results were surprising.

All these PowerBooks took well over a minute to start up from a shutdown state. As in other benchmark tests, the 3400c came in first, taking an average of 1 minute, 13 seconds. The 2400c was a close second at 1:15. But the results we got from the three 1400 configurations caught us off guard: The 117-MHz model started up in 1:17, on average, just behind the leaders, and the 1400c/133, fresh out of its shrink-wrap, took an average of 1:20. The 1400c/166, also brand-new, lagged the field, averaging 1:38 to start up.

The same 166-MHz unit also brought up the rear when we measured time to wake up (including spinning up the hard disk): It needed an average of 15 seconds to wipe away the eye hockey. Oddly enough, next slowest was "the world's fastest laptop," the 3400c/240, which averaged 13 seconds. The 133- and 117-MHz configurations of the 1400 turned in averages of 10 and 8 seconds, respectively. The clear winner in this contest was the 2400c, with an average wake-up time of 5 seconds.

MacUser LABS

	Price As Tested	Processor/ Clock Speed	Bus Speed/RAM/ Hard Drive/L2 Cache	MacBench 4.0 Processor Score	Disk Score	Publishing Disk Score	Graphics Score	Lo-Res Publishing Graphics Score
PowerBook 3400c/240 ♦♦♦½	$5,500	603e/240MHz	40MHz/16MB/3GB/256K	337	191	193	250	*
PowerBook 3400c/200 ♦♦♦♦	$4,500	603e/200MHz	40MHz/16MB/2GB/256K	308	159	165	257	251
PowerBook 3400c/180 ♦♦♦♦½	$4,000	603e/180MHz	40MHz/16MB/1.3GB/256K	293	131	142	218	226
PowerBook 2400c/180 ♦♦♦♦½	$3,500	603e/180MHz	40MHz/16MB/1.3GB/256K	299	152	142	186	198
PowerBook 1400c/166 ♦♦½	$3,500	603e/166MHz	33MHz/16MB/2GB/128K	153	86	131	144	*
PowerBook 1400c/133 ♦♦♦	$3,000	603e/133MHz	33MHz/16MB/1.3GB/128K	142	76	117	140	114
PowerBook 1400cs/133 ♦♦♦	$2,500	603e/133MHz	33MHz/16MB/1.3GB/128K	142	76	117	140	114

Best performer in each test

*Test not run.

All products, configurations, and prices are as of August 2, 1997.
Both PowerBook 1400/133 models, the 1400c/166, and the 3400c models were tested with Mac OS 7.6; the 2400c/180 was tested with Mac OS 8. Memory control-panel settings (Disk Cache and Virtual Memory) were set as shipped. MacBench 4.0 scores are relative to those of an Apple Power Macintosh 6100/60 running System 7.5.5 with a 30-MHz memory bus, 16 MB of RAM, 2 MB of built-in graphics RAM, no L2 cache, and a 250-MB hard drive. This baseline system is assigned a score of 100 for all MacBench tests. All systems were tested as configured by vendors but with AppleTalk turned off and virtual memory turned on. Screen resolution was 800 x 600 pixels with a bit depth of 8 bits (256 colors).



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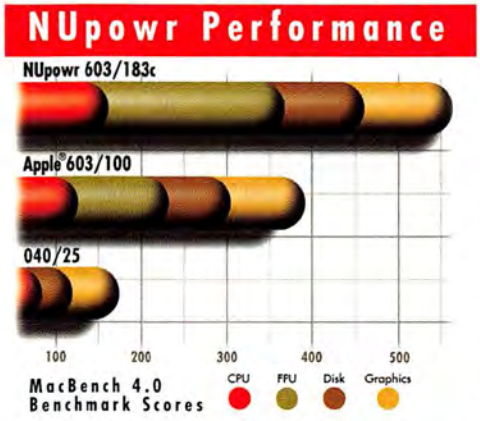


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And how's this for slick, Slick? BookEndz is a multi-port – make that *every* port – docking station that eliminates the need for connecting all those cables that make your PowerBook a desktop. You connect the cables once to the BookEndz dock and leave it at your home or office. Then just slide your PowerBook into the dock as slick as you slide into your T-top Lamborghini. No muss. No fuss. No disconnected cables with pins to bend up. (What? No Lambo?)

There's more. Give our Web site a hit for more info. This is just the Cliff's Notes. Which is all you've got time for when you're speed reading on your way to your next exciting adventure in PowerBook World. Power on, Gearhead.

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In The Army Now
The PowerBook Army Web page plays host to a vast collection of information and software for the mobile-Mac road warrior.
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keys (finally in an intuitive inverted-T layout) and 12 function keys — into the 2400's small dimensions, Apple and design partner IBM had to reduce the pitch — the distance from the center of one key to the center of the next — to 16.5 mm. That's considerably smaller than the 19-mm pitch that's standard and even smaller than the Duo's 18-mm pitch.

Apple and IBM realized that with the keys that close together, users were more likely to strike them off-center, so the companies employed something called "scissor technology" — a pair of criss-crossed springs — to mount each key; the design is supposed to ensure that keys will be activated even if they are hit from an odd angle.

We know several users, some of whom were highly skeptical at the outset about such a tiny keyboard, who quickly adapted to typing on the 2400 and now find its size a nonissue. But in a week of fairly frequent use, this reviewer frankly never became comfortable with the keyboard and continued to make far more typos than usual. As a result, we strongly recommend that you spend some time typing on a 2400 before you invest in one of your own. (On the other hand, we adjusted quickly to another feature that seems to bother some users: a mustache-shaped clicker below the new mini-PowerBook's trackpad.)

If you do choose the 2400, the investment required is substantial — the only configuration Apple offers, with 16 MB of RAM and a 1.3-GB hard drive, is $3,500. You'll probably need more RAM, and if you also require an external CD-ROM drive and a PC Card modem, you're easily past the $4,000 mark.

At that price, the 2400 isn't for everyone. Even if you can afford it, you'll face a tough a choice between it and the similarly priced 3400. If you can't get comfortable with the 2400's tiny keyboard, the choice is obvious. Likewise, if you make heavy use of CD-ROMs or often use your PowerBook for presentations (and using the built-in video-out port isn't an option), you'll probably want to give the nod to the 3400, with its CD-ROM module and larger screen.

But for those who rely on their notebooks mostly for e-mail, personal-information management, and serious productivity applications or even graphics applications, the 2400 is a snappy little system that's a pleasure to use. If you're a frequent traveler, your arms and shoulders will forever thank you for picking this little wonder.

Henry Norr, who has over a decade of experience testing and writing about Macs, has forgotten more about the Macintosh platform than most people will ever know.

THE VERDICT: Which PowerBook Is Right for You?

WHAT'S THE RIGHT POWERBOOK FOR YOU? It all depends on your needs, priorities, and financial situation, but here are some suggestions that might help:

STUDENTS Computer-science majors might want a 2400 or a 3400 if they can afford one, but for most students, a PowerBook 1400 should do just fine. If you're on a tight budget, check at your school's computer store for the dual-scan 1400cs/117 or the active-matrix 1400c/117. You'll give up a bit of speed compared to newer versions of the 1400, but you'll save quite a bit of money.

BUSINESS USERS If giving whizzy multimedia presentations to potential clients and customers is an important part of your work, your best bet is a PowerBook 3400 — its fast CPU, 12.1-inch screen, and removable CD-ROM drive will help keep your show clear and crisp. If you're going to be compiling code or crunching big numbers on the road, you'll appreciate the speed of a 2400 or 3400. If you take a PowerBook on your travels mainly to check your mail and surf the Web or whip off a few memos, any model will do. A 1400 is fine if you want the CD-ROM option and the boss won't spring for a 3400; if you don't care about having an internal CD-ROM drive and you can get authorization to spend a little more, you'll appreciate the 2400's light weight and small size — provided that you can adjust to its keyboard size.

FREQUENT FLIERS If the keyboard is not a problem and you don't require a CD-ROM drive, the 2400 is the best PowerBook yet for use in flight. It even fits nicely on the tray table. And when you're in the airport, you'll be surprised at how much faster you can dash from Gate 6 to Gate 96 when the Mac in your briefcase weighs 4.4 pounds instead of 7 or 8 pounds.

SINGLE-SYSTEM TYPES If you want a single system that will work in the office and on the road, any of today's PowerBooks will do, unless your work demands the fastest available processors and drives, PCI expansion cards, or 24-bit color on large screens. A 1400, however, will leave you trailing in performance substantially behind colleagues with more-modern Macs; since you're saving money by having only one system, you've got a good case for using some of the savings to fund a faster 2400 or 3400. The 3400's internal-modem/Ethernet card is nifty, but you end up with the same capabilities if you install a modem and an Ethernet adapter on separate PC Cards or a PC Card with both functions. (However, you should also consider that PC Card Ethernet is slower than a PCI-based network connection.)

FOLKS WITH AGING EYES The screens on all three current PowerBook series have a fixed resolution of 800 x 600 pixels, so they all show the same amount of information. But the larger the screen, the bigger those pixels will be, and that can make the information they represent — particularly type in small point sizes — much easier to make out. From that point of view, the 3400 is your best bet, the 2400 the worst.

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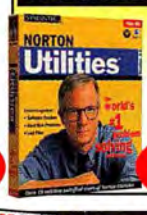
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BY JIM SHATZ-AKIN

Locating Yourself

Make your PowerBook manage its own settings with Apple Location Manager

LOCATION, LOCATION, LOCATION — it's the mantra for anyone looking to buy a home, establish a new business, or travel with a PowerBook. Where you happen to be when you fire up your portable bears directly on how you want your system configured. And your system setup, in turn, has broad implications for data security, battery life, system performance, and your ability to work efficiently.

Recognizing that you don't want to waste time switching a host of control-panel settings each time you use your PowerBook in a new locale, Apple introduced Apple Location Manager with the PowerBook 1400 in October 1996. This utility, accessible from the Control Panels folder and the Control Strip, enables you to create clusters of system settings for each place you visit with your PowerBook. When you move from home to office, studio, or school, you simply select your new location from a list, and your custom settings are switched instantly.

Location Manager doesn't do everything you might hope it would, and configuring it can be tricky, but if you're patient and careful, it can save you lots of time and trouble.

Setting Up Your Settings

In theory, configuring Location Manager is simple: You open the Location Manager Control Panel (see Figure 1) — either directly from the Control Panels folder or via a Control Strip pop-up menu (see Figure 2) — select a location to edit (Home and Office are included by default), and copy an existing location set by clicking on the Duplicate button. Alternatively, you can build a set from scratch by clicking on the New button.

When the Location Editing window opens (see Figure 3), it presents you with the system configurations you can assign to your chosen location. Among the configurations are Default Printer, which sets the printer you've selected in the Chooser and the Desktop Printers control panel; Extensions Manager, which switches Extensions Manager to the custom startup set of your choosing; File Sharing, which controls settings in the File Sharing control panel; Networking, which controls settings in the AppleTalk and TCP/IP control panels; Sound, which sets system sound volume; and Time Zone, which resets the System Clock for different time zones. The remaining option, Auto-Open Item, allows you to select files or applications to launch when you switch to your new location; if used cleverly, this can be the most powerful of Location Manager's settings.

No default settings are specified for a new location. To create a setting, you start by selecting one of the System Settings configurations. The current setting for that configuration appears in the System Values window beneath the list; if that current setting is the same as the one you want for your new location, you simply click on the Add button, and that setting item appears in the scrolling list on the right side of the Location Editing window, indicating that it's attached to your new location. If you want a different setting, and chances are you will, you have to switch the system setting to the one you desire for your new location, using the Chooser or appropriate control panel(s) in your System Folder.

Chaotic Control Panels

Changing settings in control panels is where things begin to get tricky. To be fair, much of this is not the fault of Location Manager itself but rather of the unfriendly design of Mac OS control panels. For example, setting Networking attributes requires you to navigate the dreaded AppleTalk and TCP/IP control panels. When you open those control panels, enticing pop-up menus make it look easy to create new settings for your location, but *don't touch them.* If you do, you risk permanently losing your current settings and those catchy, easy-to-remember IP addresses and domain-name-server IDs. Instead, you must remember to use the Configurations command, on the AppleTalk and TCP/IP control panels' Edit menus, to create a new configuration for each location — and only then should you begin fooling with the pop-up menus.

Once your settings are finished, you return to the Location Editing window in Location Manager and click on the Add button to attach the new settings to the location set you're working on.

Other settings — Default Printer, File Sharing, and Time Zone, for instance —



Figure 1

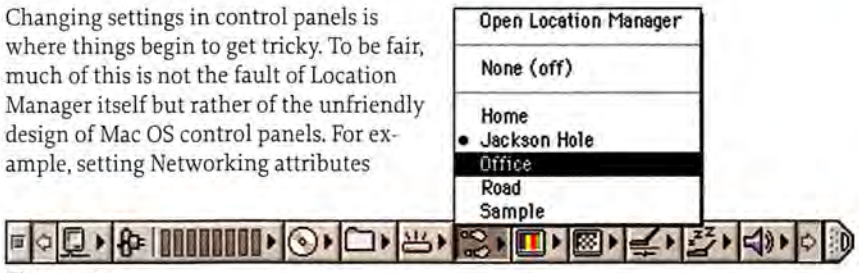


Figure 2

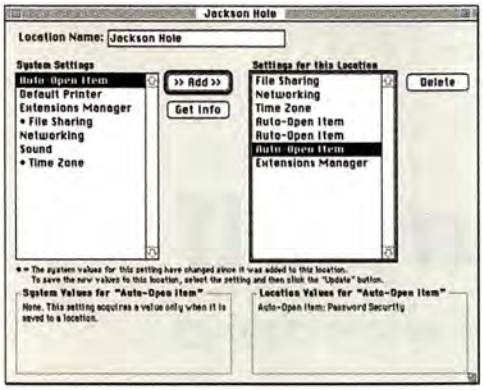


Figure 3

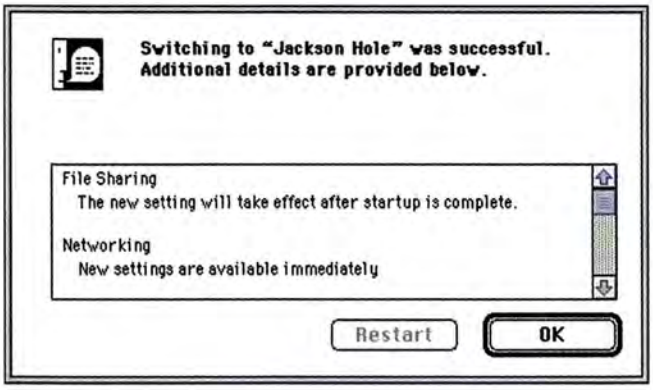


Figure 4

are much easier to configure. And even if you get confused, help is always near: You can click on the Get Info button in the Location Editing window for guidance. The info here is sketchy, but each Get Info item points to the appropriate topic in the Mac OS Guide, on the question-mark Guide menu (or Help menu in Mac OS 8), for more-detailed instructions.

After a few rounds of clicking from Location Editing to Get Info to the Guide menu and back, we found ourselves dearly wishing for hot links among the various help sources — and, in this case, to the control panels to which they refer. Still, the mere existence of online help is a real benefit when you're trying to fathom Location Manager settings.

Auto-Opening Moves

The least documented of Location Manager's functions — the Auto-Open Item setting — is its most powerful. You use it to instruct Location Manager to open files, applications, or other items whenever a new location is selected.

To invoke this feature, double-click on Auto-Open Item in the Systems Settings list in the Location Editing Window and choose your target file from the Open dialog box. One of our favorite uses for this function is to remount server volumes: Designate server aliases as Auto-Open Items, and when you switch locations, you'll be prompted to enter the appropriate password for each server. You can also have the computer perform customized tasks by making an AppleScript an Auto-Open Item. (The Synchronize Folders script in the More Automated Tasks folder is useful, although custom scripts would undoubtedly be easier to use.)

If you're not up to a little AppleScripting, you can still use Auto-Open Items to open those applications you want to change for a given location and then enter the changes manually.

Version 2 Wish List

Although we found setting up some Location Manager features a bit awkward, we found them truly useful once they were all configured. In the end, our biggest disappointment with the utility isn't with how it works but rather with what it doesn't do. For instance, Location Manager does nothing with Apple Remote Access. We'd love to be able to tell ARA the area code and, where appropriate, the default dial-out numbers, passwords, and modem settings for a given location. We'd also like to be able to have power-conservation settings in the PowerBook control panel configurable for different locations and situations. (Apple: If you do this, please let us set processor cycling as well.)

We also hope Apple is working with third-party developers to extend location management to other applications, so that your PIM's auto-dial function will know when you switch area codes or whether your current location requires dialing 9 for an outside line and so that your e-mail package will know that it should switch your default signature when you move from home to the office.

One final, quibbling wish: We'd like the option of bypassing the dialog box that tells us that all of our configurations have switched correctly for our new location (see Figure 4). It should tell us if something goes wrong but, if all's well, not make us bother clicking on the OK button to get on with our work.

Five Tips to Help You Manage Location Manager

Configuring Location Manager is as much an art as it is a science. Here are a few tips to help smooth location setup:

TIP 1 Configure each location *on* location. Configuring networking settings or default printers requires you to be physically connected to the network you want to configure.

TIP 2 Make unique locations for all of your work sites, even if some share identical settings. Things *will* change over time, so create — and use — separate locations for all of your regular workplaces. That way, when you have to make inevitable tweaks for a given spot, you won't inadvertently foul up settings you use in another location. (Likewise, assign a unique Extensions Manager set to each location and tweak as needed.)



TIP 3 Use the Preferences command on Location Manager's Edit menu to get a prompt to choose a location at each startup (see figure). This saves you grief when you change to a location that includes custom Extensions Manager sets or other settings that take effect only on restart.

TIP 4 Create reminders to cover items Location Manager can't handle automatically, such as changing DialAssist settings in Apple Remote Access. Write yourself a note in SimpleText or Stickies, and set Location Manager to auto-open the reminder when you switch locations. You can also use this reminder note to keep useful information, such as your hotel phone and fax number, handy.

TIP 5 Save backup copies of your location settings. Each location configuration exists as a separate file in the Location Manager folder in your Preferences folder. The copies will save you lots of time if anything goes wrong with your setup, and you can also use them to assign locations to other computers.

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BY ANDREW GORE

Hot Shots

Digital imaging arrives for the PowerBook



Coolpix 100

POWERBOOKS and digital cameras used to have about as much in common as Cadillacs and radishes. The relatively low-power CPUs and smaller, 8-bit-only displays that mobile Macs used to be saddled with made them less-than-ideal imaging workstations. That, combined with the massive amount of storage digital images require, pretty much left PowerBook photography to truly dedicated shutterbugs.

Then last spring Apple released the PowerBook 3400 series. A fast I/O bus, combined with a snappy CPU, a large 16-bit-color screen, and multigigabyte internal storage (not including optional removable-storage drives), transformed the PowerBook into an ideal portable platform for digital imaging.

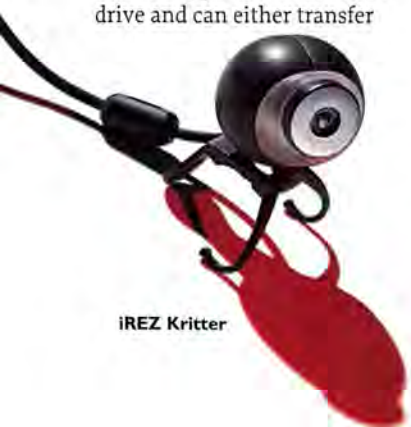
Spy Gear

Create a third-party opportunity, and they will come — for once this truism seems to be true, as several vendors have recently announced digital-imaging gadgets tailored to the PowerBook. One of them, from Hitachi, is an impressive little number with the melodious name of **MP-EG1A.** Sound like something straight out of the CIA's Spy Gear Catalog? Read on.


MP-EG1A

This camera, for a hefty $2,499.95, does more than just take a few snapshots: It can record up to 20 minutes of MPEG-1 video (352 x 240 pixels) and take 3,000 JPEG photos (740 x 480 pixels), 1,000 JPEG photos with up to 10 seconds of sound each, or up to 4 hours of audio attached to a single image. It comes with a 260-MB Type III PC Card hard drive and can either transfer images directly to a PowerBook (by using included software) or output them to a TV or VCR via built-in AV jacks.

The MP-EG1A has all the controls you'd expect on a camcorder — fast forward, rewind, play, record, and pause — plus it has a 1.8-inch LCD display/viewfinder and a 6x zoom (3x optical plus 2x digital). The camera even has a pivoting head, a stand, and a credit-card-sized remote control for taking those clandestine videos. It can run continuously for up to 40 minutes on its single, rechargeable lithium-ion battery and weighs just under 20 ounces with battery and PC Card hard drive installed. About the only thing this bit of 007 gadgetry doesn't do is fire a laser or spew out a smoke screen. Maybe next year's model.


iREZ Kritter

Kritter Country

For those with budgets smaller than MI5's, the **iREZ Kritter** offers direct digital-video input to your PowerBook for a frugal $349.95. Although the strange little device looks as if it might get up off the top of your PowerBook and walk away, its bizarre appearance is functional — the clawed feet allow it to securely clutch the top of a portable clamshell, the perfect position from which to record your smiling face during your next video teleconference.

The Kritter Cam connects to a PC Card, which, taking advantage of ZoomedVideo support on the 3400- and 2400-series PowerBooks, transfers video directly to a portable's screen buffer at a full 30 fps at 16-bit color and 320 x 240 pixels (the number of frames per second captured will depend on the speed of your mobile Mac's CPU). The Kritter also supports digital zoom and allows users to control exposure, shutter speed, and color gamma. It comes with Kai's Power Goo SE, Photo Soap SE, and QuickTime Conferencing.

iREZ is also offering CapSure, a $149 video-in PC Card that allows a PowerBook to preview video at up to 30 fps at 8-bit color and 640 x 480 pixels; video capture is at 320 x 240 pixels. The card requires ZoomedVideo support (available on 3400 and 2400 PowerBooks only) and has NTSC-video-composite and S-Video in.

Slot Shot

A video camera isn't the only digital-imaging dongle you can plug into a PC Card slot. Nikon's **Coolpix 100** *is* a PC Card with a digital still camera grafted on top.

The $399 Coolpix can take up to forty-two 512-x-480-pixel JPEG photos at standard resolution or 21 JPEG images in high-resolution (albeit lower-compression) mode. The tiny card-camera — which weighs 5 ounces and measures 6 x 1.33 inches — runs on four AA batteries stored inside a handle the Coolpix card plugs into when it isn't in your PowerBook's PC Card slot. Want to star in your own photo shoot? The Coolpix has both a timer and a built-in flash, just in case you're standing in the dark.

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Secrets

The Picture-Perfect Desktop

WANT TO KNOW WHAT SOMEONE'S REALLY LIKE? LOOK AT THEIR DESKTOP.

by Joseph Schorr



The desktop is one of the most fundamental parts of the Mac's file-management system—and also one of the most revealing. Your desktop pattern, your choice of fonts, your custom icons and how you choose to arrange them all provide an instant snapshot of who you are and how you work. Have you ever noticed how desktop aesthetics vary wildly from user to user?

I know one woman who keeps all her desktop icons (the Trash, hard drive, mounted file servers, everything) in one impossibly tight clump at the bottom left corner of her screen—all against a forbidding desktop background of solid black. Another guy in my office has wallpapered his desktop with that cloying Teddy Bears pattern, and he uses 24-point BrushScript as his icon font. This guy doesn't have to worry about security problems on his Mac; no one else in the office can even stand to *look* at his machine, let alone tamper with it.

In keeping with the spirit of desktop individuality, here's a collection of tips for transforming your desktop into a workspace that is uniquely your own.

Picture This . . .

Thanks to Mac OS 8's Desktop Pictures control panel, you can now decorate your desktop with full-screen pictures instead of just tiled patterns. Open the control panel and click on the Picture button, and you can drag a picture file onto the minidesktop in the control-panel window to install it. You're not just limited to standard Mac PICT files; you can also turn any GIF, JPEG, or Adobe Photoshop image into a desktop graphic. Here are some tips to keep in mind when installing new desktop pictures:

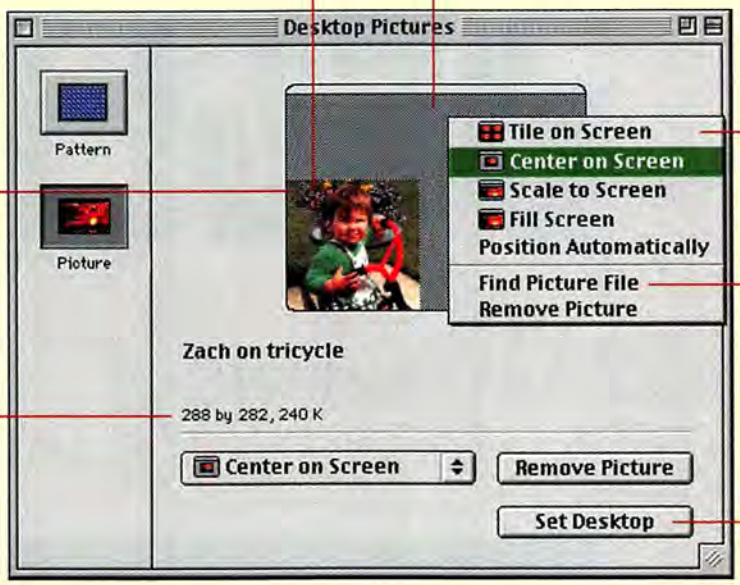
- The fastest way to access the Desktop Pictures control panel is to simply control-click on the desktop itself. A contextual pop-up menu appears with the command Change Desktop Background, which opens the Desktop Pictures control panel.
- Using this undocumented trick, you can create a desktop picture from a selection *within* an image file, instead of the whole file. Open an image file in a drag-and-drop–aware program, such as SimpleText; select the portion of the picture you want to use; and then drag your marqueed selection directly into the Desktop Pictures control panel. Your selection will become a new desktop picture.
- For the most-impressive results, try to use images that contain exactly the right number of pixels to fill your

continues

JAMES YANG

Designer Desktop

THE DESKTOP PICTURES CONTROL PANEL is the design center for creating a unique desktop background. Here are some of the tricks and shortcuts you can use when setting up desktop pictures and patterns.



screen—640 by 480 pixels for a 14-inch monitor, for example. This way, the control panel won't distort the image or leave gaps around the edges.

• Once you've installed a desktop picture, control-clicking on the minidesktop within the control panel itself brings up yet another contextual pop-up menu that lets you control how your picture will be positioned on the desktop—scaled to fill the screen, tiled, centered, and so on (see "Designer Desktop").

• Pressing ⌘-F in the Desktop Pictures control panel when a picture is installed automatically takes you to the Finder and locates the original image file from which the desktop picture was created.

• There are three ways to remove a desktop picture: You can drag it from the minidesktop to the Trash, click on the Remove button, or control-click on the minidesktop and choose the Remove Picture command. But if you're replacing one picture with another, you don't have to use any of these commands; dragging a new picture onto the control panel automatically clears the previous picture.

• Drag a whole folder of image files to the Desktop Pictures control panel, and the Mac randomly chooses from among the files and installs a different desktop picture each time you start up.

• The pop-up menu in the Desktop Pictures control panel gives you just a few options for positioning a desktop picture—you can have the picture centered, stretched to fill the screen, tiled across the screen in rows, or proportionately scaled. However, by using the arrow keys in conjunction with the option key, you can fine-tune the positioning of your picture. Pressing the option and up-arrow keys with the Center On Screen option selected, for example, aligns your picture with the top of the desktop (against the menu bar). Pressing option–left arrow shifts the picture to the screen's far-left edge. With the Tile On Screen option selected, you can use these same keystrokes to determine the starting point for tiling a picture.

• Want to try something weird? Take a snapshot of your desktop by using the Mac's built-in screen-capture command: ⌘-shift-3. Then take the resulting picture file (which appears on your hard disk as Picture 1) and install it as a desktop picture. The wild result: all your desktop icons appear directly on top of exact replicas of themselves. Start dragging things around, and you'll think you're seeing double. Try this on a coworker, and watch him get very, very confused.

Bring Out the Buttons

There's more to custom desktop design than placing a cool photo in the background. Mac OS 8's improved View options, for example, allow you to place large or small Launcher-like buttons on the desktop. Drag a bunch of buttons together, and you can create a launcher bar for one-click access to frequently used files.

While buttons are convenient, you might find that you have trouble positioning them on the desktop. You can't drag a button, since just one click launches it. The secret is to drag buttons around by their names, not by the icons themselves.

For a sleeker launcher bar, eliminate the button names—actually, just drop the names below the line of visibility on the desktop. The trick to getting buttons into this position is to place a second button above the one you want to drop to the bottom of the screen and then drag-select over both buttons. Then click on the name of the upper button to drag both into the desired position. When you're done, click on the desktop to deselect the buttons and then drag the upper button away, leaving the lower button nestled at the bottom of the screen, its name completely hidden. **m**

JOSEPH SCHORR is coauthor of *Macworld Mac Secrets*, fourth edition (IDG Books Worldwide, 1996).

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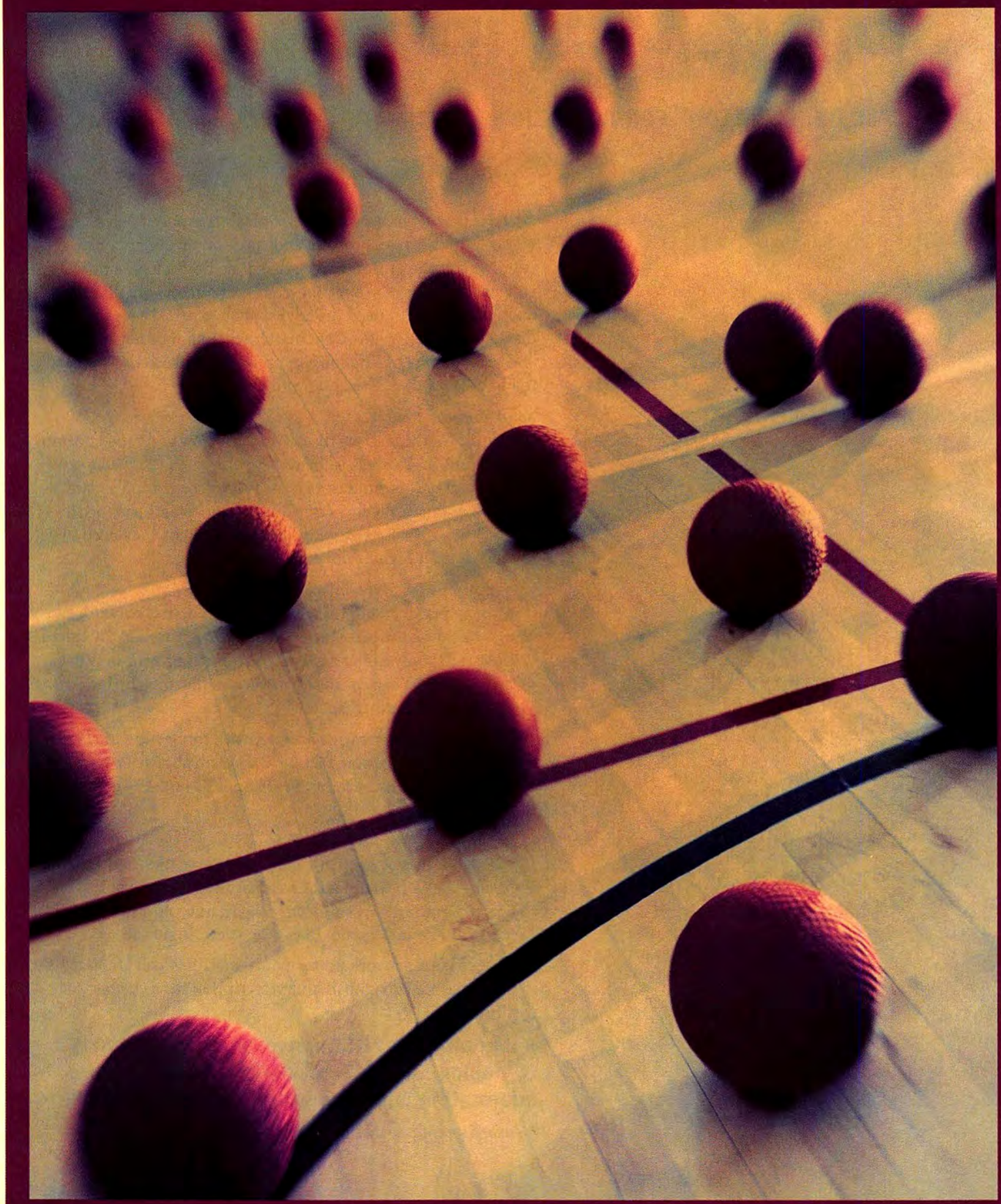
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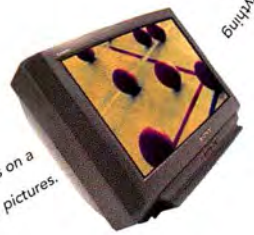
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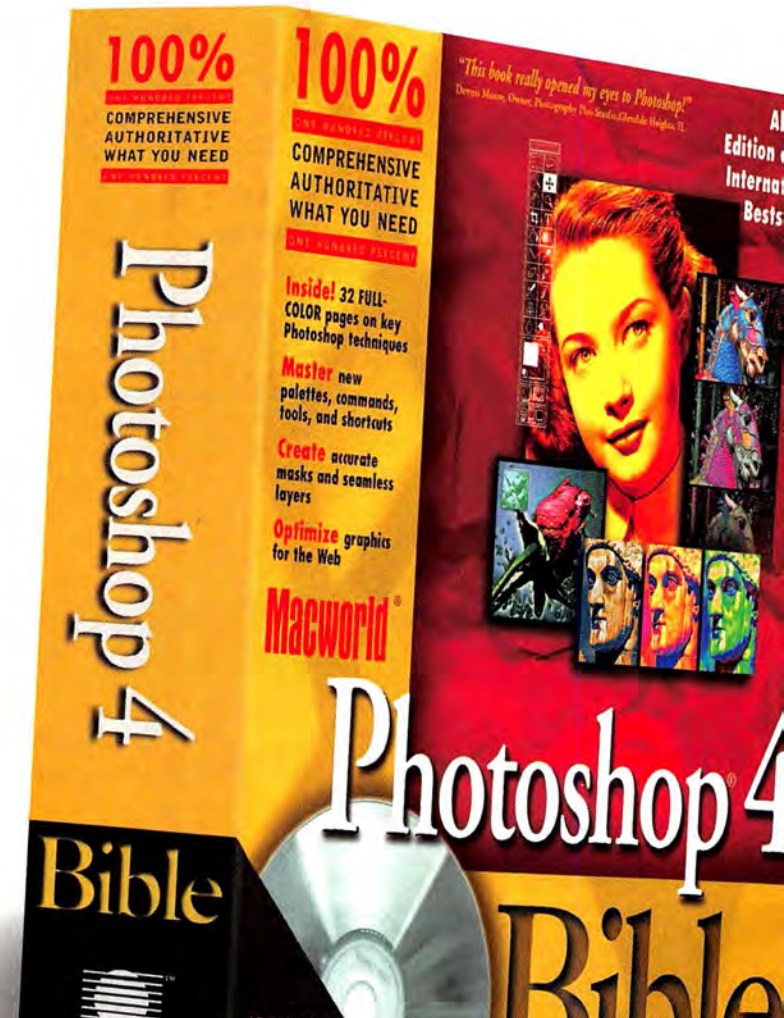
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Quick Tips

Tips, Tricks, and Shortcuts

by Lon Poole

Every time you open the handy Connect To accessory program from the Mac OS 8 Apple menu, you see the same URL in its dialog box, namely http://www.apple.com (Apple's main home page). The URL is preselected (highlighted), so you can replace it by typing another URL you want to connect to. If you don't want to type a new URL every time you connect to the Web, you can change Connect To so it displays a different default URL. Actually, you should change a copy of Connect To so you have the original file as a fallback.

You can change your copy of Connect To with the Script Editor application that comes with Mac OS 8, because Connect To is actually an AppleScript applet (small application). It doesn't look like an applet, because it has a custom icon. In addition, Apple changed its four-letter file type from APPL (the file type for ordinary applications) to APPD (the file type for applications that the Finder automatically puts in the Apple Menu Items folder when you drag them to the System Folder icon).

The Script Editor application can't open the copy you make of Connect To unless you change the copy's file type to APPL. There are many utilities that can change file types, including Apple's free ResEdit resource editor (use its Get File/Folder Info command) and my long-time favorite, Daniel Azuma's free FileTyper application.

After changing the file type of the Connect To copy, open it with Script Editor (which is in the AppleScript folder inside the Apple Extras folder on the Mac OS 8 start-up disk). You'll see the AppleScript script that determines what the applet does. Look for the following command near the beginning of the script, and change the URL in it to the one that you want used by default:

```
set defaultURL to "http://www.apple.com"
```

Save the changed applet, and close its Script Editor window. This causes the applet to lose its custom icon, but the applet still works. Of course, you can copy and paste the custom icon from the Get Info window of the original Connect To applet to the Get Info window of the modified applet. You can also rename the modified applet like any other file in the Finder.



Incidentally, the Connect To applet uses the settings in the Internet Config application to determine which Internet application to use for Web browsing, e-mail, FTP access, and so on. To change these settings, open Internet Config (it's in the Internet Utilities folder inside the Internet folder on the Mac OS 8 start-up disk) and click the Helpers button. For example, the Helpers setting for HTTP determines which Web browser is used when you enter an http:// URL in the Connect To dialog box as well as when you double-click the Browse the Internet applet on the Mac OS 8 desktop.

Covert Crayons

Q I love Mac OS 8 (so far, at least). In all the demos I saw before purchasing OS 8, there was a color picker with a crayon look. Where is this feature?

RON DOBBS
Sioux City, Iowa

A There are two places in Mac OS 8 itself where you can use the new color picker. For one, it appears when you choose Other from the Text Highlight pop-up menu in the Color section of the Appearance control panel. The new color picker also appears when you click any of the label colors in the dialog box of the Finder's Preferences command. (Notice that in OS 8 you don't set these colors in the Color or Labels control panels.) In addition, the new color picker should appear in application programs that let you specify a color by using the standard Mac OS color picker. For example, in a ClarisWorks paint document or paint frame (but not in other kinds of ClarisWorks documents or frames), you can select a new fill or line color by tearing off the fill color or the line color palette and double-clicking an existing color that you want to replace with another color from the new color picker.

continues

JEFFREY PELO

Long File Names

Q. Is it possible to maintain a file name with more than eight characters when transferring files from the Mac OS to Windows 95 or NT and vice versa?

C. S. CHOW
Honolulu, Hawaii

A. The DOS Mounter control panel, from Software Architects (425/487-0122, www.softarch.com), truncates Windows 95 file names, which can be up to 255 characters long, to the 31-character limit of the current Mac OS. (Apple plans to increase the limit to 255 characters and make other major filing-system improvements in a forthcoming update of Mac OS 8, although it may be a while before the Find and Save dialog boxes give you access to the longer file names. (For details, see "Apple Readies Revision to Mac OS," *News*, in this issue.) For example, a Windows 95 file named Energy Saving Procedures for Office Equipment might become Energy Saving Procedure~DLE.doc. The *DLE* are random characters that DOS Mounter generates to ensure a unique file name. The *.doc* is the DOS file-name extension that identifies the application with which to open the file (in this case, Microsoft Word).

If you copy Mac files to Windows 95 disks, DOS Mounter retains the full file names. In addition, DOS Mounter retains the traditional DOS file names (eight characters plus a three-character extension) when transferring to or from DOS, Windows 3.1, or Windows 95.

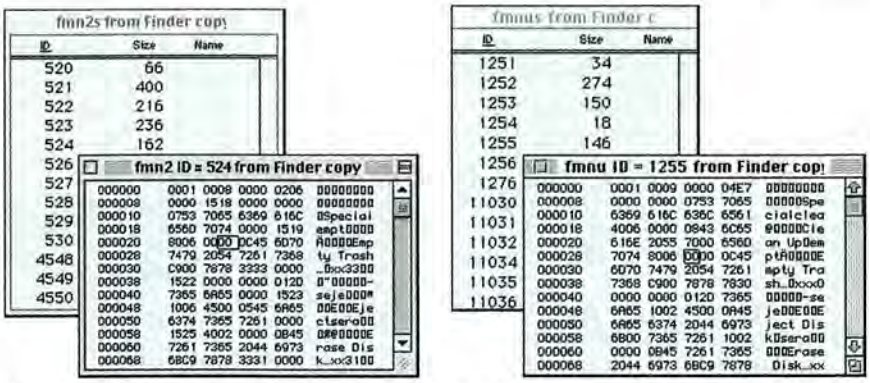
Obsolete in OS 8

Q. Under System 7.6.1 and earlier, the performance of text operations on a Power Mac benefited by keeping the WorldScript Power Adapter file in the Extensions folder. Do I still need that file in Mac OS 8?

NICHOLAS CIPOLLA
Fairfield, Connecticut

A. You don't need that file, because it's built into the Mac OS 8 System file. So are CFM-68K 4.0 (the Code Fragment Manager for 680X0 Macs, which enables them use America Online 3.0, LaserWriter 8.4.2, OpenDoc, Cyberdog, and more) and ObjectSupportLib 1.2.1 (for AppleScript support on 680X0 and Power Macs). In addition, the Finder now contains most of the functionality formerly provided by the following files, making them obsolete: Clipping Extension, Desktop Printer Extension, Finder Scripting Extension, Network Extension, and PC Card Extension.

Mac OS 8 works with QuickDraw GX typography and graphics but not GX printing, so you don't need GX printer drivers or GX printing extensions. All PowerTalk files are also useless with OS 8, including Catalogs Extension, DigiSign Extension, Mailbox Extension, Mail Folders Extension, PowerTalk Extension, and PowerTalk Manager. Finally, new control panels and the Finder itself have supplanted the functions of the following control panels: Color, Desktop Patterns, File Sharing, Monitor, Labels, Sharing Setup, and Views.



Keys to the Finder To add or change a keyboard equivalent for a Finder command, use ResEdit to open the fmn2 resource (in Mac OS 8, left) or fmnu resource (prior to Mac OS 8, right) in a copy of the Finder. Then select the third character before the menu item's name and type the keyboard equivalent you want to assign.

Clock-Battery Replacement

Q. Whenever I turn on my 7100/66, the clock has to be reset, along with the highlight colors, map, and alert sounds that I have set. I suspect the battery needs to be replaced. Is this something for a dealer, or can I do it myself? The manual doesn't say what replacement battery to use.

RICK KEENE
via Macworld Online

A. These sound like classic symptoms of a dead clock battery, all right. The 7100/66 uses the same battery as the 6100/60, 6100/66, 8100/80, and many other desktop Mac models as far back as the Mac II and SE. It's a 1/2AA size, 3.6V lithium battery (Apple part number 742-0011, Hitachi Maxell ER3S, Tadiran TL5101 or TL2150, Electrochem 3B26, Eternacell T04/41, Varta VL1/2AA, or Radio Shack 23-026). Some older Macs and all newer Macs (including the 7100/80, 8100/100, and 8100/110) use different clock batteries. You'll find Apple part numbers for batteries for all but the latest Macs, which shouldn't need batteries yet, in Apple's Technical Information Library article 11751, which is available on the Web (til.info.apple.com).

Apple considers the clock battery replaceable on some desktop Macs and includes instructions in the owner's manuals for these models. The 7100 is not one of these, probably because the battery is kind of hard to get to, but you can remove the Mac's cover (as described in the computer's manual), eyeball the battery, and decide for yourself whether you want to try replacing it. The 7100's clock battery is under the disk drives and is accessible from the side of the computer with its cover off. You'll find pictures of the battery for this and other models on the Macintosh Battery Web site (www.academ.com/info/macintosh/).

Keep in mind that while the cover is off the computer you could accidentally damage something inside that would be expensive to repair. Proceed with caution; if you're the least bit squeamish, let a technician do the work.

The specific procedure for replacing a clock battery varies, because the battery's location depends on the computer model. The following description gives you an idea of the work involved. Before replacing the battery, it's a good idea to

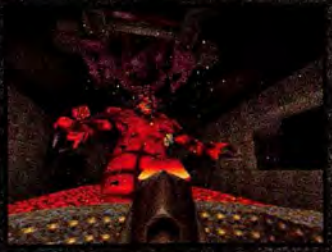
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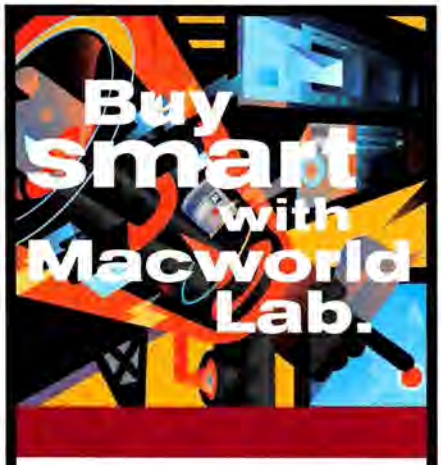
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use the free TechTool program to save the settings stored in the computer's parameter RAM (PRAM). The PRAM stores a number of control-panel settings, as well as secret settings such as number of hours the computer has been used, and removing the battery may reset them to factory defaults. To replace a Mac's clock battery, remove the computer's cover and touch the metal power supply housing to drain off any static charge you may be carrying. Next, pry off the plastic cage that covers the battery. Carefully note the orientation of the old battery's positive and negative ends. Then pop out the old battery and snap in a new one with the same orientation as the old one. Replace the battery cage and the Mac cover, and restart the computer. If you saved PRAM settings with TechTool, use it now to restore the settings. Otherwise, check your control-panel settings and change them as needed.

Vocal Proofreader

TIP There's one specific benefit of using Text-to-Speech that I didn't see mentioned in Joseph Schorr's excellent *Secrets* column ("The Mac Speaks Out," August 1997), although it may be obvious to some. I've used Text-to-Speech as an administrative assistant who proofreads my writing without any disturbing human tendency to skim over errors. Redundancies and other problems that go undetected when read silently become immediately noticeable when heard in the efficient, yet soothing, voice of trusty Text-to-Speech Fred.

JOHN BOXMEYER
Bristol, Pennsylvania

Personally, I like Victoria.—L.P.

Faster File Sharing

TIP If you have ever shared files from your computer, you know how bogged down your Mac can get. The slowdown is, of course, compounded when the file sharing is done remotely. The best way to combat this is to create a RAM disk and put all the items that you want to share in it. Then share the RAM disk. Trust me; it works. A friend of mine copied almost 1MB from my computer while I typed this letter. My computer never began to slow down, respond slowly, or have any of the side effects that come with remote-access sharing, even though I was using Word 6!

MATT RADTKE
Jefferson, Wisconsin

From Find File to Trash

TIP When you use Find File in Mac OS 8, a bug prevents you from successfully dragging multiple items that you have selected in the Items Found window to the Trash. You can work around this problem by dragging the found items to an alias of the Trash.

MARTIN GONZALVEZ
Nutley, New Jersey

About This Computer: The Menu

TIP If you choose About This Computer from the Apple menu in Mac OS 8, you can do more than review a list of open programs and the memory they use. Control-click any listed program to pop up a contextual menu from which you can bring up Mac OS Help, switch to the program, or open the Get Info window for the program. When I first saw this list of open programs in System 7.0, I wondered, Why can't you use this to switch among them? Now you can!

ADAM B. MARK
via Macworld Online

Finder Keyboard Shortcuts

TIP As you may know, adding or modifying ⌘-*key* equivalents in the Finder was pretty straightforward prior to Mac OS 8. Using ResEdit, you opened the particular fmnu resource for the Finder menu that included the menu item whose keyboard equivalent you wanted to change, selected the third character before the menu item's name, and changed it to the keyboard-equivalent character you wanted. For example, you could open fmnu resource ID 1255, select the third character before the Empty Trash command, and change it to a *T*, thereby making the keyboard equivalent for Empty Trash be ⌘-T.

When I got my hands on Mac OS 8, I found that the same procedure works,

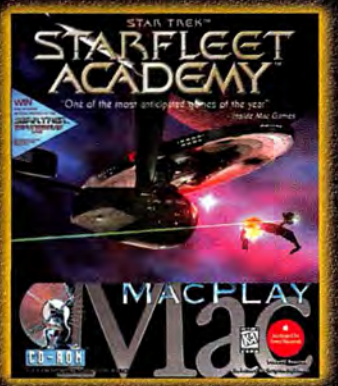
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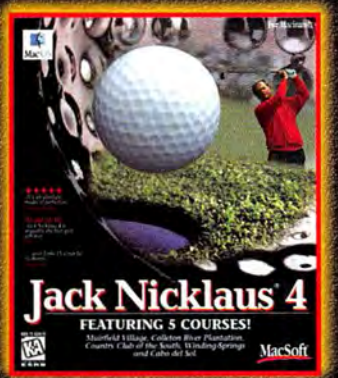
















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except that the resource is named fmn2. All the Finder menus are different in Mac OS 8, so be careful. And of course, *always* work on a copy of the Finder or any other file you change with ResEdit. "Keys to the Finder" shows how to edit an fmnu resource or an fmn2 resource.

MICHAEL SAJI
West Hills, California

There are other ways to add keyboard shortcuts to Finder menus, such as downloading files whose contents you can copy and paste with ResEdit into the Finder and installing macro utilities that can attach a keyboard shortcut to any action. But this method is free, pretty easy, and lets you pick your own keyboard equivalents. Note that there are actually two fmn2 resources for each menu in the Mac OS 8 Finder. One is used when the Simple Finder option is turned off in the Finder's Preferences dialog box, and the other is used when this option is turned on. Here are the resource IDs for fmn2: 521 File, 522 Edit, 523 View, 524 Special, 527 File (simple), 528 Edit (simple), 529 View (simple), 530 Special (simple). The fmnu resource IDs for the Finder prior to Mac OS 8 are 1252 File, 1253 Edit, 1254 View, 1255 Special, 1256 Label.—L.P.

Cache Check

TIP If you're running Mac OS 8, you may have noticed your Mac slowing down after you've zapped the parameter RAM (PRAM). Zapping the PRAM resets the Disk Cache setting (in the Memory control panel) to the lowest setting (96K). Try resetting the Disk Cache to at least 1,024K; you'll notice a big difference in opening windows and emptying the Trash.

TOM NEGRINO
Culver City, California

LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. His latest book is *Macworld Mac OS 8 Bible* (IDG Books Worldwide, 1997).

Shareware mentioned in *Quick Tips* is available from Macworld Online (www.macworld.com) or America Online (keyword Macworld).

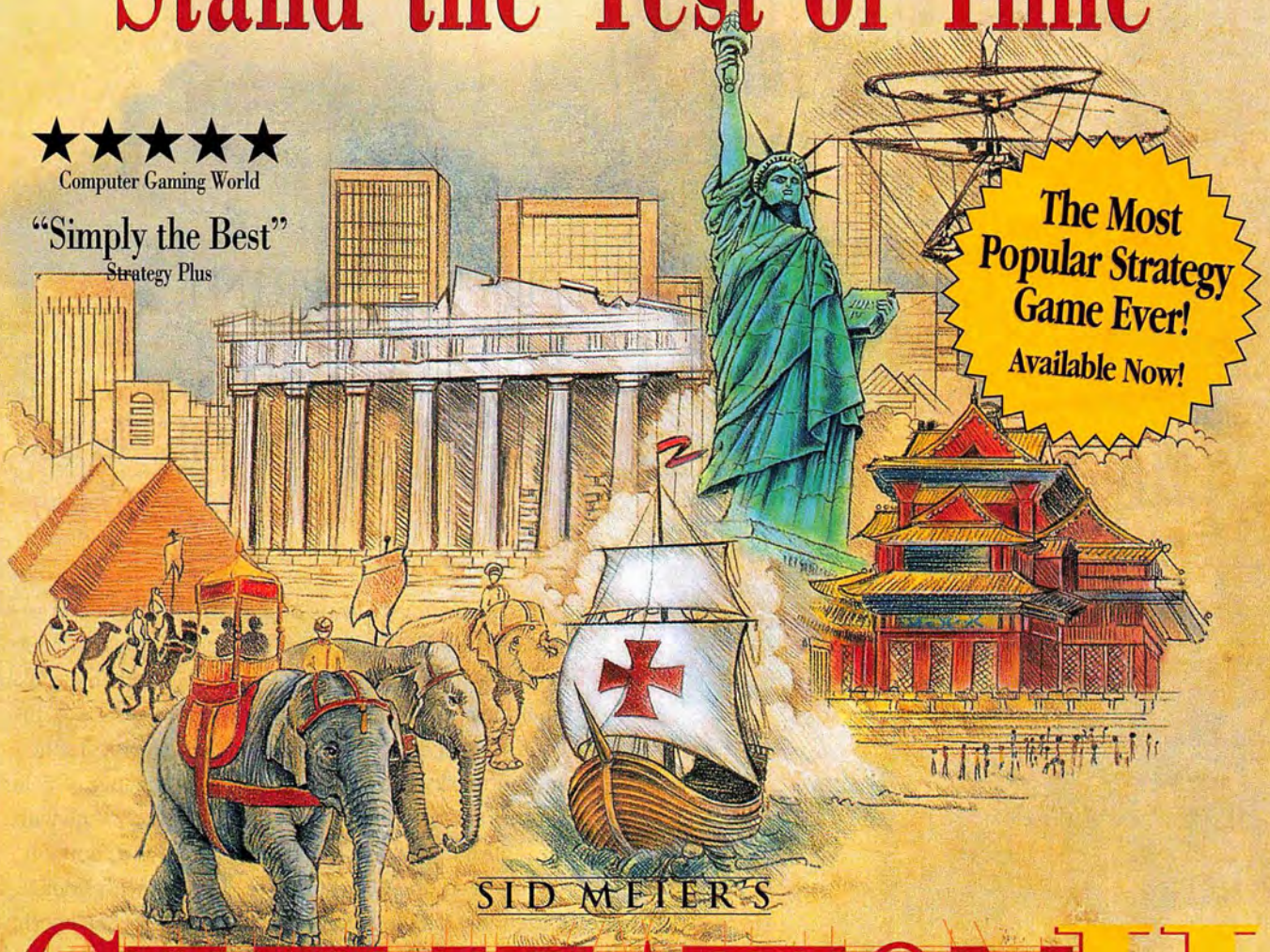
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Media

Stupid JavaScript Tricks

THREE SIMPLE JAVASCRIPTS THAT ADD SPICE TO YOUR WEB PAGES

by Jim Heid



JOHN RITTER

Want to perk up your Web pages? Try a spot of JavaScript to enhance your pages' interactivity and make them easier to navigate. JavaScript's name implies it's a simple, easy-to-learn scripting language. The truth is that JavaScript is a full-fledged programming language that requires considerable programming skills to master fully.

But that doesn't mean it isn't useful to the rest of us—far from it. There are innumerable ways to spice up a Web page with JavaScripts, and there are just as many sources for canned scripts that you can apply to your pages with just a few easy modifications.

This month, I present three JavaScript tricks for you to try. Ranging from extremely simple to fairly complex, they illustrate how JavaScript can enhance a Web site's user interface to make it more dynamic and CD-ROM–like.

Because JavaScript isn't fun to type—and because, as with any programming language, typos equal failure—the longer scripts aren't printed here. To get the complete scripts and for links to more JavaScript information sources, visit www.heidsite.com.

Where the Scripts Live

All of the scripts I present here are *client-side* scripts: They execute on a computer that is running a JavaScript-capable Web browser. When the browser reads a page containing a script, a JavaScript interpreter swings into action and executes the script.

Generally, client-side JavaScripts live directly within an HTML page. I say "generally" because it's possible to store a script in a separate file and then call it from an HTML page. This is a useful technique if you want to run the same large script on multiple pages.

What about that phrase *JavaScript-capable browser?* There are just two, but they are the top two browsers: Netscape Navigator and Microsoft Internet Explorer. JavaScript debuted in Navigator 2.0, and Netscape has enhanced it for each Navigator release.

For Internet Explorer 3.0, Microsoft developed its own implementation of JavaScript, called JScript. The two are very similar, although there are enough incompatibilities to make life difficult for advanced scripters. (Would you expect

continues

Fun with Status Bars

JavaScript lets you control the contents of the browser's status bar, that area at the bottom of the browser window where URLs and download-status information appear. You can take advantage of this to provide feedback and information.

Default Messages With the JavaScript **defaultStatus** property, you can specify a message that appears in the status bar as long as that page is visible. When visitors move the mouse pointer over a link, the link's URL replaces the message. But when they move the pointer off a link, the default message reappears. You might use this script to provide help for beginners ("Click on the underlined text to go to other pages") or to give a brief description of a page ("Subscribe to our e-mail newsletter here").

This script displays a message in the browser's status bar.

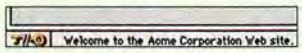
```
<script>
defaultStatus = "Welcome to the Acme Corporation Web site."
</script>
```

Rollover Messages A slightly more complex variation on the theme involves displaying a different status-bar message for each link on a page. When the pointer moves over a link, a message rather than a URL appears in the status bar. Use this feature to provide a brief description of the link ("About our products" or "Check out our Web cam").

This rollover status-bar trick works not only with hypertext links but also with the links in client-side image maps (discussed in *Media*, July 1996).

In order to have a message appear when the mouse pointer is over a link or within an image-map hot spot, you should place this tag within the link. Type your message between the single quotes in the **onMouseOver** statement. The **onMouseOut** statement clears the status bar when the pointer leaves the link.

```
<a href="products.html"
onMouseOver = "status='Learn about our products'; return true;"
onMouseOut = "status='';">
Products</a>
```



A default message appears while the page is visible.



A rollover message appears only when the mouse pointer is over a hot spot.

Rollover Graphic Buttons

Eyecatching buttons that change color or shape when the mouse pointer moves over them are one of my favorite JavaScript tricks. So-called rollover buttons have a dynamic, CD-ROM–style appearance.

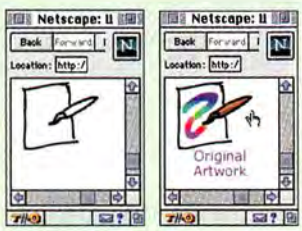
A somewhat lengthy script, excerpted here, enables you to create rollover buttons. You can download the entire script from www.heidsite.com.

Alas, this script doesn't work in Microsoft Internet Explorer. It does work in Netscape Navigator 3.X and 4.0, though, and it doesn't cause error messages in Explorer.

Before using this script, you must create two graphics for each button: One graphic contains the button in its normal form, and the other contains it in its rollover form. Both must be the same size.

TIP: This script pairs up nicely with the status-bar message script. When visitors move the pointer over a button, the button changes shape *and* a status-bar message appears. Dynamic enough for you?

```
<a href="intro.html"
onMouseOver="over('introduction');
window.status='What is No Back Roads?'; return true;"
onMouseOut="out('introduction')"><imgname='introduction' src="gfx/introduction-o.gif" height=14 width=97 border=0></a>
```



These rollover buttons (from the www.webmonster.net site) use a script similar to the one I've posted. The image on the right shows what happens when you move the mouse over the button.

anything else from the Microsoft-Netscape rivalry?) Of the scripts presented here, all but one, Rollover Graphic Buttons, work on both Navigator and Internet Explorer 3.0 and later versions, on both the Mac and Windows. The button-rollover script doesn't work on Internet Explorer, but it doesn't cause any problems or error messages.

In your travels with JavaScript, you'll sometimes see scripts enclosed within the **<script>** and **</script>** tags; at other times you'll see scripts used as attributes for existing HTML tags. Scripts can reside in different places within an HTML page. Generally, scripts used as attributes for HTML tags perform a simple task that relates to the tag itself—for example, adding a message to the status bar when the mouse pointer is over a hyperlink. Scripts sandwiched between **<script>** and **</script>** are typically more complex and often define tasks that are called elsewhere in the page—for example, swapping one graphic with another when the mouse pointer moves over a link graphic.

Using the Canned Scripts

With the appetizer out of the way, now let's move on to the main course. Each of the scripts included in this article (plus one bonus script for creating a remote-control navigation window) is available at www.heidsite.com. Each contains comments on how to modify the script for your pages.

These comments don't describe in detail how the scripts work. (I myself am not a JavaScript programmer—the scripts here are ones that I've picked up from books and JavaScript resource sites. I've listed several good sources in "Where to Learn More about JavaScript.") But that's the beauty of JavaScript. We nonprogrammers can work with it on a simple level to perk up our pages. At the same time, programmers can use JavaScript to accomplish sophis-

A Navigation Pop-up Menu

Another popular JavaScript-based site-navigation aid is a pop-up menu that enables visitors to jump to a specific page. Navigation pop-ups are handy because they pack a lot of navigation power into a small space and they're easy to use.

A No-Go Variation

While some navigation pop-up menu scripts require that a visitor click on the Go button to confirm his or her choice, this one doesn't. Instead, it swings into action the moment a visitor chooses a destination. In other words, the script provided here works exactly the way a Mac OS or Windows menu does (the www.webreference.com JavaScript Tip of the Week contains such a script).

TIP: For the Web, I prefer having to click on a Go button. It's too easy to accidentally choose an option (or to choose the wrong option) because your finger slipped off the mouse button—and on the Web, a mistake like that can cost a visitor several seconds in annoyance while the browser locates and displays the wrong page.

```
<html>
<head>
<title>A Web Page</title>
<script language="JavaScript">
<!--// hide
/*
Live popup menu script from "HTML & Web Publishing Secrets" (IDG Books, 1997)

Original code is Copyright (c) 1996 Athenia Associates, all rights reserved. By Andrew King (aking@webreference.com) of webreference.com. Modified by Jim Heid.

To use this script, you must modify the lines below that begin "var siteopt" and "var url."

In the line that begins "var siteopt," replace the items within quotes (Breakfast, Lunch, Dinner, Snack) with the names of the categories or pages on your site. You can add additional items; just make sure each one is enclosed within quotes and that a comma separates each quoted item.
Next, modify the line that reads "var url," replacing the HTML page names with the appropriate URLs.
*/
function createArray() {
    this.length = createArray.arguments.length+1
    for (var i = 0; i < this.length-1; i++)
    this[i+1] = createArray.arguments[i]
    }
var siteopt = new createArray ("Breakfast", "Lunch", "Dinner", "Snack");

var url = new createArray ("breakfast.html", "lunch.html", "dinner.html", "snack.html");

function jumpPage(form) {
    menuNum = document.menu.primary.selectedIndex;
    window.location.href = url[menuNum+1];
}
// -->
</script>
</head>
<body bgcolor="#ffffff" text="#000000" link="#0000ff" vlink="#ff0000">
<script language = "JavaScript">
<!--
with (document) {
write('<center><table width=465 border=0 cellpadding=5 cellspacing=0>');

write('<form name = "menu"><tr>');
writeln('<td valign=top colspan=2>');
writeln('<font size = -1 face = arial>Select an area</font><br>');

writeln('<select name="primary" onChange="jumpPage()">');

tot = siteopt.length;

for (var i = 1; i < tot; i++)

writeln("<option>" +siteopt[i]);

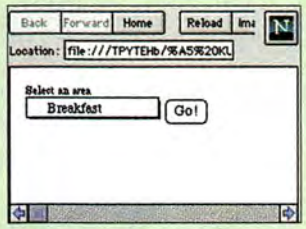
writeln('</select>');

write('<input type = button value = "Go!" onClick ="jumpPage()">');

write('</td></tr></form></table></center>');
}

// -->

</script>
</body>
</html>
```



JavaScript lets you create a menu of choices for navigating your site.



Clicking on the menu pops up topics you can jump to.

ticated tasks: checking and calculating information entered into a form; tracking a user's progress through a site with browser cookies; and handling a shopping cart that enables visitors to shop until their browsers drop.

One thing JavaScript can't do is prevent a writer from ending a JavaScript column with a coffee pun. That takes willpower, strength of character, and a burning desire to stick to the . . . script.

My Final Column

My first *Macworld* column appeared in the March 1985 issue—153 consecutive columns and nearly 400,000 words ago. This, I'm sad to say, is my final column. *Macworld* and the Mac world are undergoing numerous changes these days, and the *Media* column as we know it today is one casualty of this evolution. But look for my work elsewhere in future pages of *Macworld.*

It has been a genuine pleasure to appear here each month. I have learned something new with every column; if you did, too, then I've done my job. Thanks for reading. **m**

JIM HEID's *HTML & Web Publishing Secrets* (IDG Books Worldwide, 1997) contains dozens of canned JavaScripts and not a single coffee pun.

Where to Learn More about JavaScript

The Web itself is a terrific JavaScript resource. Take a look at Gamelan (www.gamelan.com) and JavaScript Tip of the Week (www.webreference.com/javascript/). The latter is no longer being updated, but its archive offers more than 30 tips.

The best JavaScript book I've found is *JavaScript: The Definitive Guide,* second edition, by David Flanagan (O'Reilly & Associates, 1997). A great cookbook is *Designing with JavaScript,* by Nick Heinle (O'Reilly & Associates, 1997).

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- 80 PostScript fonts, 15 PCL fonts
- 8MB RAM expandable to 64MB

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Publishing Workshop

Using Layout Grids

by Olav Martin Kvern

Ask a group of graphic designers about the production tools most page-layout programs offer, and you'll get an earful. Designers, who call on a chaotic world of limitless possibility for inspiration, often complain that paragraph styles, layers—even frames—are too restrictive; that a systematic approach to page layout is a bad thing.

This attitude, widespread as it is, seems silly. For me, the greatest enemy of experimentation in a design project is the time it takes to do the production work. The less time I spend on production, the more time I can spend thinking creatively and experimenting. A layout grid is a great timesaving production tool.

A layout grid is a framework that helps you determine where to position elements on the pages of a publication. In a way, the grid *is* the design. You can build these grids using the rulers and guides found in your page-layout application. The trick is knowing what to base your grid on.

Let Type Be Your Guide

Type—even small amounts—imposes a grid. We see structure in the lines and spaces that columns of text create. We get confused when something breaks the pattern. I base my grids on the leading I've chosen for my layout's body text, so I don't have to worry about repositioning columns of type to match up baselines. (Misaligned text baselines scream amateur page layout.)

You need to mark out the layout's vertical spacing by placing horizontal guides (rulers) that are separated by the amount of leading you've chosen for body text. Next, you need to set up your text containers so that the distance between the top of the container and the baseline of the first text line is also equal to the leading of your body text. Once you've done that, you can align the top of the text block with any horizontal guide and know that the baselines will match up.

Creating Columns

Once vertical spacing is set, how do you divide the horizontal space? Again, let the body text be your guide. What's a good line length for the size of text you'll be using? Lay out a few paragraphs of text from the project, using the font, type size, and leading you've chosen for your body text. How narrow can you make it before it's hard to read? How wide? Pick something between those extremes. Start with a line that holds around 50 lowercase characters in your chosen typeface. For most fonts, at most sizes, on most leadings, this produces a very readable line—or so many studies suggest—but I'm here to tell you that there is no perfect measure for all fonts, at all sizes and leadings, for every kind of text.

Building a Layout Grid

1. Pick a typeface and leading value for your publication's body text. Lay out samples of the copy you'll be using (or something like it) in a variety of widths. Start with a line two alphabets wide. Experiment to find the minimum and maximum readable widths.

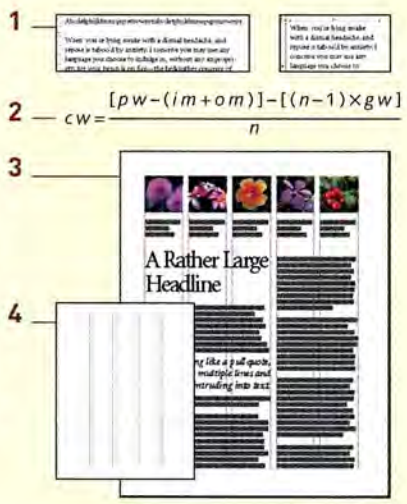
2. Use this formula to come up with the column widths for a given number of columns.

(Note: *cw* = column width, *pw* = page width, *im* = inside margin, *om* = outside margin, *n* = number of columns, *gw* = gutter width.)

Play with the variables in the formula until you have the number of columns you want to use, column widths that fall within the range you decided on earlier, and margins appropriate to your page size.

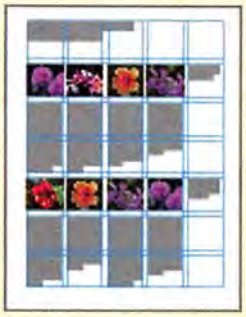
3. Set up your margins, column guides, and ruler guides based on the results of your calculations. You should leave larger margins at the outside and bottom of the page, because that's exactly where your readers will be putting their thumbs and fingers.

4. Subdividing the page vertically into chunks helps you to place elements quickly. Make each chunk a multiple of the body-text leading value; separate it from the next chunk by a space equal to the leading value.

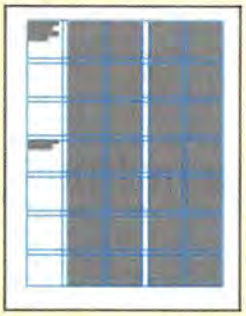


Creating Grid Subdivisions

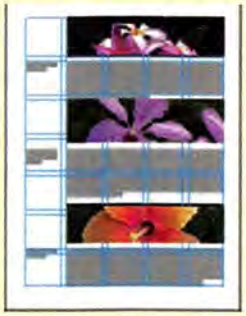
A single grid can be the foundation for a variety of designs, but pages based on the same grid will always look related. This means you can combine pages with very different layouts if your publication requires you to (think of annual reports, which mix narrative and financial data). In this example, the largest pleasing measure is about four times the smallest. With a grid using this minimum measure as the basic column width, your layouts can have text made up of one, two, three, or four grid columns.



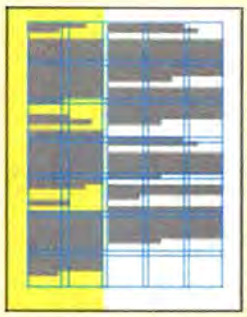
Text containers one grid column wide.



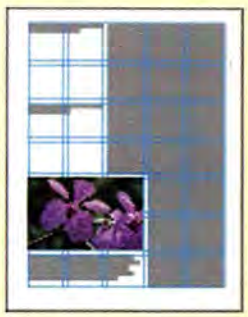
Text containers two grid columns wide.



Text containers four grid columns wide.



Mixed text widths on a page (with sidebar).



Text containers of varying grid-column widths.

Take the measure you've come up with and start dividing the page into columns that wide. Increase or decrease the measure as needed to get the columns to fit. You must also think about the amount of space between columns (*gutters*). In general, I make the space between columns equal to the leading value I've used for my body text.

Grids as Production Tool

Have you ever noticed that your decision-making powers wane as a deadline approaches? You can spend a lot of time figuring out where to put objects on your page. Using a grid largely removes this uncertainty. You just snap the objects into position on the grid. You might think these forced layout rules would make your production process more difficult, but they don't. You're substituting low-stress, mechanical work for high-stress creative work.

The key is to design a grid that's flexible enough to accommodate the design features and content you want. Here are some tricks to try.

- Create grids with odd numbers of columns. Most of the grid-based designs I work with feature five, seven, or nine columns. If you choose the size and leading of your body text carefully, you'll have a wide range of options for laying out captions, pull quotes, or headlines that span several columns.
- Subdivide the columns on your page into smaller ones. These minicolumns increase your layout options, while retaining the underlying page structure.
- Turn on Snap to Guides. Most page-layout programs feature the ability to snap objects to guides, which simplifies the task of getting objects into the correct position. With this feature enabled, objects you're moving or drawing automatically hug the nearest guide when they get close to it (you specify the distance).
- Other "snaps" can help, too. In PageMaker, you can set the vertical ruler that runs down the side of the page to match the leading of your body text and then turn on Snap to Rulers.

Organize Creative Chaos

Finally, a little structure isn't a bad thing. Every layout you design helps the reader decode information. Designs based on a grid give you a systematic way of structuring the message you want to get across. This does not mean the grid has to be visible. On the contrary, readers will perceive and respond to the arrangement of objects even if it's not immediately obvious. m

Where's the First Baseline?

You cannot actually snap the baselines of text to guides on a page (though the Lock to Baseline Grid feature in QuarkXPress can help by moving text baselines to match an underlying grid you set up in the Typographic Preferences dialog box), but you can fake it by snapping the top of the text's container to those guides. The trick is to set up your text containers so that the space from top of the container to the baseline of the first text line is the same as the space you've used for your grid. Here's how.

IN ADOBE PAGEMAKER Use the Baseline leading method. If you specify 14-point leading, the baseline of the first line of text will fall 14 points from the top of the text block or text frame.

IN MACROMEDIA FREEHAND Use the First Line Leading field in the Columns panel of the Text Inspector to specify the distance from the top of the box to the baseline of the first line of text. Use the pop-up menu attached to the field to choose the Fixed leading method (that's the equal sign on the pop-up menu), and then enter the leading value in the field.

IN QUARKXPRESS Select a text box, and press ⌘-M to display the Text Box Specifications dialog box (it's in the Modify dialog box in QuarkXPress 4.0, and you also have to click on the Text tab). Next, in the First Baseline section of the dialog box, choose Cap Height from the Minimum pop-up menu and enter your leading value in the Offset field. Note: This method won't work if your leading value is smaller than the cap height of the font you're using (the cap-height value is set by the font designer and is stored in the screen font).

OLAV MARTIN KVERN wears many hats: software developer, graphic designer, illustrator, and writer. He is the author of *Real World FreeHand 7* (Peachpit Press, 1997).

Graphics Workshop

Creating Complex Masks and Shadows in Photoshop

by Cathy Abes

ARTIST Katrin Eismann is a Los Angeles–based artist, photographer, and educator whose work has appeared in publications such as *The Photoshop Wow! Book*, *American Photo*, and *Computer Artist*. She's currently working on an Adobe Photoshop techniques video series and a book on digital photography.

HOW IT WAS DONE Separating a complex image from its original background in Photoshop can be arduous. Eismann has developed shortcuts, plus an easy way to make natural-looking drop shadows.

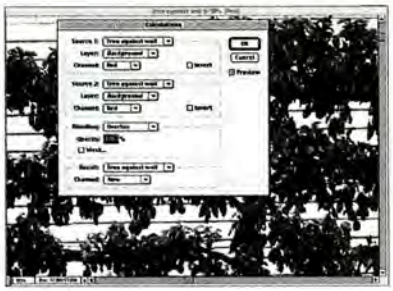
To separate the tree from the wall in this digital photo, Eismann created a complex mask that maintained the tree's fine tonal detail. First, she created a luminance mask based on the channel with the most contrast. Using Calculations with the Overlay blending mode allowed her to boost the channel's highlight and shadow density without losing any detail. Next, she used Curves to transform the luminance mask into a high-contrast mask. Finally, she removed the dark areas around bricks.

After dragging the tree onto its new background, she realized that the tree's existing shadow looked unnatural against it. She used a layer mask to paint over the shadow. To make a new one, she duplicated the tree, repositioned it, and applied Motion Blur. She composited the shadow with the tree by setting the blending mode to Multiply at 75 percent opacity.

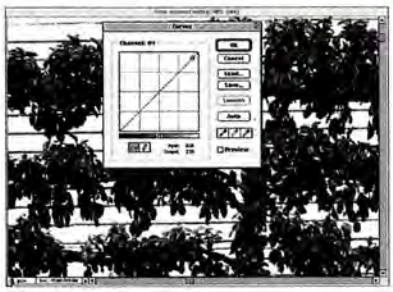
TOOLS **Hardware:** Power Mac 9500/180MP with 230MB of RAM, 2GB internal hard drive, and two 2GB external hard drives; 17-inch Mitsubishi Diamond Pro 17TX monitor; 6-by-9-inch Wacom ArtZ graphics tablet; Kodak Professional DCS 460 Digital Camera; Umax PowerLook II 600-dpi flatbed scanner. **Software:** Adobe Photoshop 4.0. m



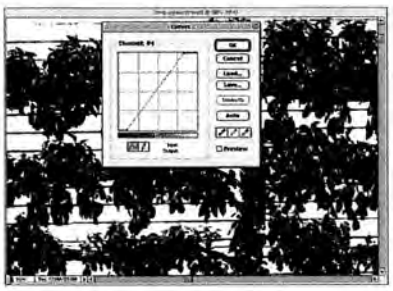
1 The original photo Eismann took of the tree, using the Kodak Professional DCS 460 Digital Camera.



2 To accentuate the tonal values of the image, she opened the Calculations window (making sure to click on Preview), selected Red for both channels, and chose the Overlay blending mode (to darken the dark areas and lighten the light areas). Then she designated a new channel for the blend.



3 After opening the Curves dialog box, Eismann clicked on and dragged over the light areas of the image and noted the locations of the circle on the diagonal line in the dialog box.

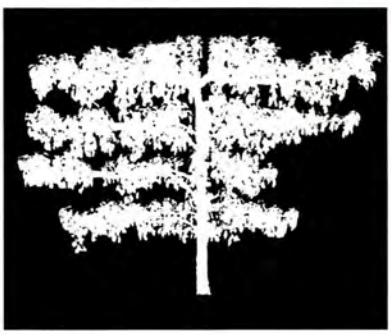


4 Eismann dragged the point in the upper-right corner of the grid along the top of the box until it was roughly as far left as the circle had been, forcing all the light areas to white. She then moved the point in the lower-left corner to the right, forcing all the dark areas to black.





5 After clicking on the eye icon to make the RGB channel visible through the still-active mask, Eismann removed the bricks around the tree with a hard-edge 50-pixel brush. She used smaller hard-edge brushes to clean up the detailed areas.



6 Once Eismann finished cleaning up the mask, she inverted it (⌘-I) to make the tree white, which meant the tree would be active when she loaded the selection.



7 After dragging the tree into a new file, she found that the existing tree shadow looked unnatural against its background. She added a layer mask to the tree layer and hid the shadow by painting on the layer mask with different-sized black brushes.



8 To make the new shadow, she first duplicated the tree layer, positioning it with the move tool slightly to the left and below the original image, and then applied a 25-pixel Motion Blur at a 45-degree angle to simulate the slight movement of a breeze.

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QuickTime Questions?
If you need help using QuickTime's sound features, bring your bafflement to discuss.info.apple.com/boards/qtime.nsf/by+Topic?OpenView

By Christopher Breen
graphicsuser@macuser.com

Make Your Site Sing

Use sound to tune up your Web site



Illustration · Will Terry

ANYONE WHO'S SWITCHED ON an AM radio between the hours of 6 and 9 A.M. has harbored fantasies of a blissful world devoid of sound. Yet without sound, the world in general — and Web sites in particular — would be dull indeed.

Who can expect to titillate an audience with page after silent page of dull text? Instead of this mute display, imagine electronic pages that *whoosh!* when you turn them, buttons and links that voice a resounding cheer when you pass your mouse over them, and dynamic soundtracks that play as your Web page opens.

Thanks to the Mac, an HTML tag or two, and a few select applications, you have the power to bring all this to your work — no audio-engineering degree required. We'll show you how to make your Web site a more harmonious experience.

The Basics

You don't need that degree, but you do need a handle on a few concepts before diving into the world of multimedia sound. To begin with, there's a variety of sound-file formats you can use, each tailored for playback on a certain platform. If you'll be delivering sound to Macs as well as Windows machines, use a cross-platform standard such as .aiff or the PC's fave format, .wav. If you expect UNIX users to drop by, use the Sun-based .au format. Which format you use can be a matter of taste — some people don't care for the sound of low-resolution .au files, and certain Mac users are loath to use .wav, a Microsoft standard.

It's also important to understand that digital audio, just like computer graphics, can be presented at different resolutions and bit depths. Just as with graphics, the higher the resolution and the greater the bit depth, the more realistic the representation *and* the larger the resulting file. Much of the work you'll do editing sound files will involve making compromises between quality and file size.

Sound Sources

Before you can perfect sounds and add them to your work, you need to obtain the sounds themselves. There are two ways to do this: Use sounds created by others, or make your own.

Just as the graphics world has clip-art packages, designers seeking sounds can purchase libraries of audio clips. Jim Heid's August '97 *Macworld* article, "Sounds from a Can," lists several good sources for sound effects as well as soundtracks. You can also find a plethora of audio files on the Internet, but beware: Not all of these files are approved for commercial use.

A sure way to avoid copyright infringement is to roll your own sounds. There's a sonorous world out there, and all you need are the proper tools to capture it (see the "Perfect Sound Setup" sidebar). First, you require a good recording device. Use a PlainTalk microphone and a PowerBook for some quick quips; for slightly higher-quality audio, use a standard cassette deck; and for optimum effect, use an audio DAT (digital audiotape) recorder, which will be much more expensive.

You also need a good microphone and a mixing board. The need for the microphone is fairly obvious — the better the signal into the recorder, the better the result. A mixing board allows you to control the level of the signal, both into your recorder and out to your Macintosh.

MIDI, Hold the Cheese
For better synthesized sound, download Headspace's free Beatnik browser plug-in from www.headspace.com or Yamaha's free Midplug plug-in from www.ysba.com/midplug_index.html

Shockwave
Macromedia
www.macromedia.com/shockwave

StreamWorks
Xing Technologies
www.xingtech.com

Several great tools can help you with the task of recording (and later, slimming) sound files, including Macromedia's SoundEdit 16, BIAS Systems' Peak, and Opcode's Audioshop. You can also use a sound-conversion utility, such as SoundSourcery's BarbaBatch. Thankfully, there are also alternatives if you're not ready to drop a wad of cash. Check out Alberto Ricci's shareware sound-editing program, SoundEffects (which has a far better display of sound-input levels than Apple's free SimpleSound), and Norman Franke's free conversion utility, SoundApp.

As you record, pay close attention to sound levels going into both the recorder and your Mac. To get the best fidelity, the sounds should be as loud as possible without distortion. Once you've captured the audio, you can reduce extraneous noise and increase the file's volume to its optimum peak by using effects such as compression, limiting, and normalize. Most audio-editing applications include a normalize function. You can add compression and limiting with an add-on effects package such as InVision Interactive's CyberSound FX or Waves' Native Power Pack.

Finally, don't record your original source material at a low bit depth and resolution, or you'll introduce noise into your sound. Instead capture audio at a robust 16 bits, 44.1 KHz and *then* use a conversion utility or an audio editor to cut the files down to size.

Shrink to Fit

Most of us are still plugging away at the Web with poky modems, so it's critical that you slim your sounds for quick downloading by reducing their bit depth, resolution, and/or number of tracks.

Let's take a one-minute, 10.6-MB, 16-bit, 44.1-KHz stereo file as an example. To quickly cut its size in half, combine the two stereo tracks into one mono track. Having only a mono track means you lose the "depth" created by discrete sounds coming from the left and right speakers, but this will probably cause the least-noticeable quality loss.

You can further reduce the file's size by changing the bit depth and resolution. Note that files become less realistic-sounding as you reduce these factors. For example, when cutting a file's bit depth from 16 bits to 8 bits, you lose half the sound's bulk but you also lose some of its *brightness* — that endless Blues Traveler harmonica solo, for example, will sound a bit less piercing. Fortunately, most computer speakers don't produce high frequencies well, so the loss of fidelity may not be very noticeable. More obvious are reductions in resolution. As you cut resolution severely — say, to 11 KHz and less — the sound becomes grainy and indistinct, like that of a cheap transistor radio.

How much you choose to reduce your files will depend on where you intend to use them. For short, downloadable Web sounds — say, a simple "Hello!" that plays as your Web page opens — use 8-bit, 11-KHz mono files. For longer clips where quality counts — a cut from your latest audio CD, for example — 8 bits is fine, but reduce resolution only to 22.05 KHz. To reduce files even further, experiment with QuickTime's built-in IMA compression.

Brevity Is Bliss

Most audio you add to your page will work better if you keep it short. Shoot for sound files of less than 50K. Considerably larger files can take too long to download and may frustrate the visitors you're trying to please.

There are several ways to add a short sound file to your Web site. If you work with raw HTML, all you need to know is that downloadable sound files are just like any other embedded downloadable file. A simple `<a href="http://www.me.com/sounds/boingee.au">` tag, for example, will embed the sound file "boingee.au" in your page. The user clicks on an audio file's link, the file downloads, and the assigned browser plug-in or helper application reproduces the sound.

If that's Greek — or Geek — to you, then you must be using a WYSIWYG Web-page-layout program. With applications such as Claris HomePage or Adobe PageMill, you can drag and drop a sound file onto the Web page, and the program will write the basic HTML tag for you.

The Perfect Sound Setup

1. A good mic: An Apple PlainTalk mic will do for a brief "Hello!" but you'll get the best results by using a professional-quality mic such as this one from Shure.
2. A recorder: For pristine digital audio, your best bet is to use a DAT (digital audiotape) recorder, but if you can't afford one, a standard cassette deck can fill the bill.
3. A mixing board: Although not essential, a mixing board will help you get the best sound possible by letting you control the input to your tape deck and the Mac.
4. Sound software: Use Peak, SoundEdit 16, Audioshop, or the shareware program SoundEffects to record your sounds into your Mac and edit them. It's also good to have a solid sound-conversion utility such as BarbaBatch or the free SoundApp.
5. Super speakers: The Mac's internal speaker is hardly hi-fi. Grab a pair of external speakers if you want to hear the full sweetness of your sounds.



Photography · Michael Falconer



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Classical MIDI Archives
www.prs.net/midi.html

RealAudio
Progressive Networks
www.realaudio.com

GraphicsUser

Here's our favorite trick: creating a sound that plays when a page is first accessed. Use SoundApp to save your sound file as a QuickTime movie (File: Convert). Be careful to add the QuickTime suffix — .mov — to your file's name. Then embed the sound in your HTML document, using the EMBED SRC tag and a few important parameters. If you have trouble, make sure you've included the correct pathname, so that the browser can find your sound file. Your code will look something like this:

```
<EMBED SRC:
"http://www.me.com/sounds/
mysound.mov"
PLUGINSPAGE="http://
quicktime.apple.com" WIDTH=8
HEIGHT=8 CONTROLLER=FALSE
LOOP=FALSE AUTOPLAY=TRUE>
```

When you preview the page in your browser, the QuickTime plug-in will load and your sound will play automatically. You can increase the ambiance by making the sound *loop* (play repeatedly). Simply change `LOOP=FALSE` to `LOOP=TRUE`. Remember to use MoviePlayer to "flatten" your QuickTime movie if you want PC users to be able to hear it.

This trick also works with multimedia-savvy WYSIWYG tools, such as Adobe PageMill, Claris HomePage, NetObjects Fusion, and GoLive CyberStudio. Most of these tools allow you to change the options via a simple dialog box.

Substantial Sounds

If your dream is to add longer audio files — that animal-husbandry speech you gave at the Rotary, perhaps — two methods may suit your needs: audio streaming and using MIDI.

Streaming eliminates the download waits that make long sound clips impractical on the Web, by "broadcasting" directly from a server to a user's browser. The audio begins playing *as* the sound file downloads. So far, streaming audio has proved most useful for reproducing long spoken pieces, such as news broadcasts. When it comes to reproducing music and other complex sounds, the quality of most streaming audio is still mediocre over a standard 28.8-kbps modem connection. More than likely, you'll also need pricey server software — fine for corporations and medium-sized businesses but perhaps too steep for the casual user. Currently, Progressive Networks' RealAudio, Macromedia's Shockwave, and Xing Technologies' StreamWorks are the most widely used audio-streaming formats.

An alternative way to add longer segments of music to your Web site without the long download time *or* the burden of a dedicated audio server is to employ MIDI (Musical Instrument Digital Interface). MIDI files are far smaller than regular digital-audio files, because they contain only a set of instructions — akin to PostScript code in the graphics world — that tell a music synthesizer how a piece of music should be played.

The Mac plays MIDI sounds through a software synthesizer (the QuickTime Musical Instruments extension) instead of through special hardware. The quality of this synthesizer's sounds is akin to that of a budget pizza — thin and cheesy — hardly a match for the higher-quality sounds of synthesizer chips. Thankfully, there are two Web-browser plug-ins — Headspace's Beatnik and Yamaha's Midplug — that provide their own software synthesizers that are superior to QuickTime Musical Instruments. If you use MIDI files on your Web site, it's well worth including links to both of these plug-ins. (Windows 95 and NT users can use the plug-ins too).

MIDI gives you the ability to do several cool sound tricks. For example, QuickTime movies carry a MIDI track, where MIDI data is stored. So what? So this: You can import MIDI files into MoviePlayer and then save them as movies. Once they're movies, you can employ the same autoplay trick we mentioned earlier to have a song begin playing as your Web page opens.

Go Forth, and Make Joyful Noise

Like all good Mac tricks, those related to sound require some fundamental knowledge — knowledge you now have. We've saved our finest tip for last, however, and best of all, this one requires no technical expertise whatsoever.

Here it is: Be tasteful. Junking up your Web site and presentations with sound can be just as distracting as garish graphics and fonts run amok. Regardless of how aurally exciting your sounds may be, if they distract readers from your work's main purpose, they're more hindrance than help.

When not engaged in journalistic pursuits, Contributing Editor Christopher Breen works as a professional musician in the San Francisco Bay Area.

Directory

Sound Applications

Audioshop, $79.95 (direct)
Opcode Systems
Palo Alto, CA
650-856-3333
www.opcode.com

BarbaBatch, $495 (list)
SoundSourcery
Escondido, CA
800-622-7723 or 760-747-5995
www.macsourcery.com

CyberSound FX, $129 (list)
InVision Interactive
Palo Alto, CA
800-468-5530 or 650-812-7380
www.cybersound.com

Native Power Pack, $600 (list)
Waves
Knoxville, TN
423-689-5395
www.waves.com

Peak, $499; Peak LE, $99 (direct)
BIAS Systems
Sausalito, CA
800-775-2427 or 510-843-6485
www.bias-inc.com

SoundApp, free
Norman Franke
www-cs-students.stanford.edu/~franke/SoundApp

SoundEdit 16 (with Director Multimedia Studio), $419 (list)
Macromedia
San Francisco, CA
800-326-2128 or 415-252-2000
www.macromedia.com

SoundEffects, $15 (shareware)
Alberto Ricci
ftp://ftp.alpcom.it/software/mac/Ricci/html/sfx.html

Sound Additions

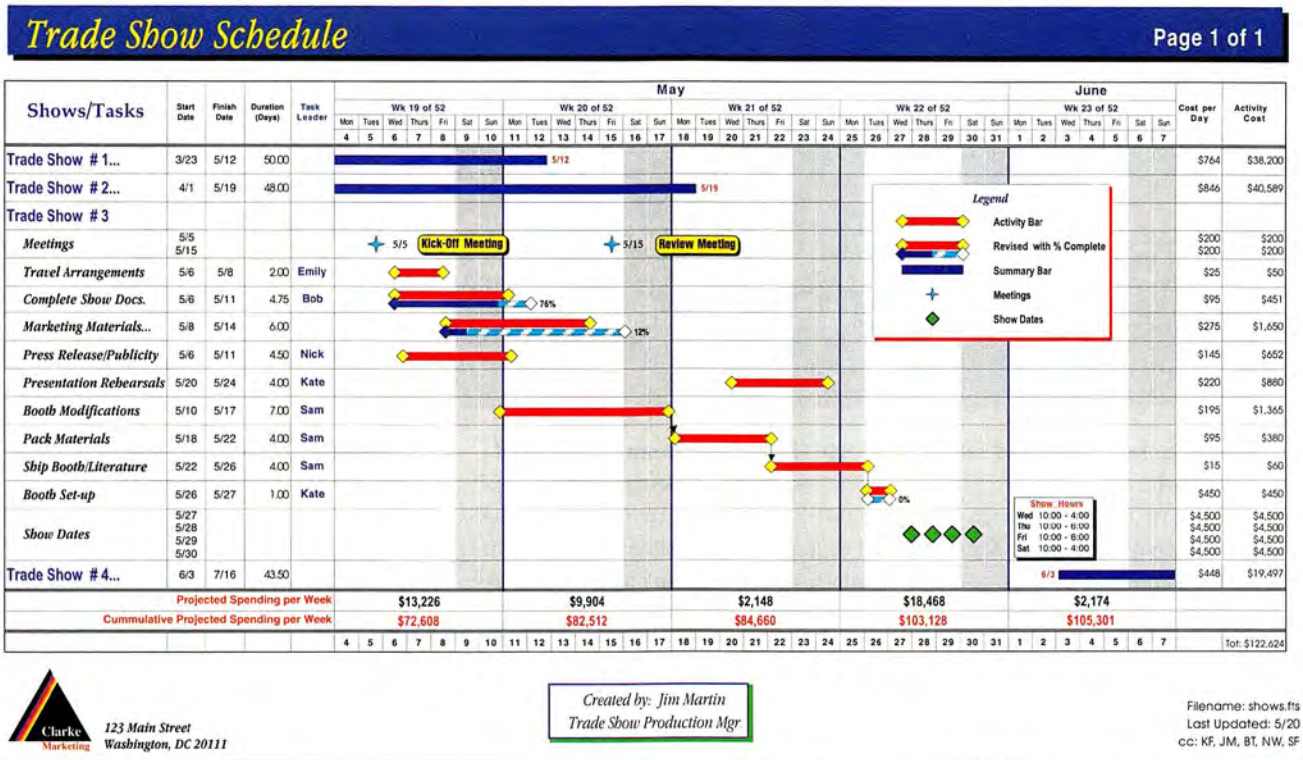
Cambridge SoundWorks MicroWorks Speakers, $219.99 (estimated street)
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By Chris Lehan
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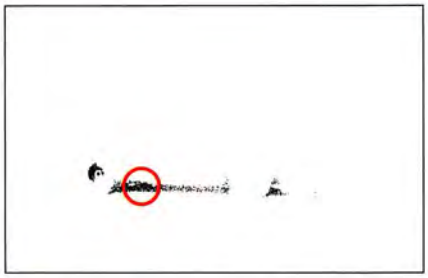
When it comes to removing color casts, trust Photoshop's Info palette, not your eyes

If "quick color correction" sounds like an oxymoron to you, it's probably because experience has proven it to be anything but. Most of us have tried at least once to fix a scan that has a horrendous color cast — hastily tweaking colors back and forth until everything looks good. Oh, the disappointment, when the rosy cheeks you finally saw on your monitor still look blue in the printed color proof!

The basic problem is that your monitor and printer understand colors in different ways. What you see on screen is rarely what you get off the press, so there is often little point to correcting color casts simply by eyeballing the screen. Calibrating your monitor will help it display print-ready colors more

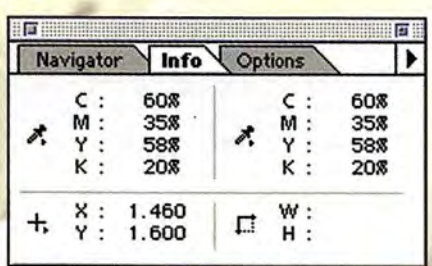






1 Examine the image, and set up your tools.

Sometimes you'll just have a hunch that something is wrong with your image. In our case, the pavement looked suspiciously green. If you find something suspect, set up your tools. Open the Info palette (Window: Show Info), click on the arrow in its upper right-hand corner to reveal Palette Options, and set the Second Color Readout mode to CMYK color. You'll use this tool to measure the actual CMYK values of your image. Also, double-click on the Eyedropper tool in the Tool palette, and choose 3 by 3 Average from the Sample Size pop-up menu. Later, you'll use the Color palette as a reference to determine the target values for neutral gray. Open it, (Window: Show Color), click on the arrow in the palette's upper right-hand corner, and select CMYK Sliders. Click on the arrow again; select Color Bar; and in the dialog box, select Grayscale Ramp from the Style pop-up menu.



2 If possible, sample the CMYK values of a neutral gray area.

Sometimes, fixing a color cast in the neutral-gray areas will eliminate the majority of your color cast. Look for neutral grays first. Often you'll find a neutral gray in clothing, walls, or pavement, as in our example. (If there's no neutral gray in your image, it's fine to base your correction only on the shadow and highlight values.) If there is a neutral gray, drag the Eyedropper over the area and record the CMYK values from the Info palette. A neutral gray should have roughly equal parts of magenta and yellow, with slightly more cyan, but our image's gray was composed of 60 percent cyan, 35 percent magenta, 45 percent yellow, and 15 percent black. Our image was already quite saturated. Therefore, to make the magenta and yellow equal, we decided to reduce the yellow rather than increase magenta. To figure out just how much to reduce it, we used the Color palette as a reference. We dragged the Eyedropper along its grayscale ramp until the magenta and yellow display read 35 percent. We then wrote down the cyan and black values — 47 percent and 8 percent, respectively — for use in step number 5. Our neutral gray would be 47 percent cyan, 35 percent magenta, 35 percent yellow, and 8 percent black.

3 Examine the CMYK value of your image's darkest point.

The next step is to examine your image's darkest shadows. Select the threshold command (Image: Adjust: Threshold), and turn preview on. The threshold command is usually used to convert graphics to high-contrast black-and-white images, but you can also use it to locate the lightest and darkest pixels. Drag the threshold slider all the way to the left until the image turns completely white. Then pull the slider back to the right until the first significant black blotch appears. (Ignore small pin dots; they're probably just dust or scratches.) Place the Eyedropper tool on this area, and jot down the CMYK readings from the Info palette. (After taking the reading, be sure to click on Cancel to get rid of the Threshold dialog box.) In general, a neutral shadow should have roughly equivalent amounts of magenta and yellow, with a larger amount of cyan. We used target values of 80 percent cyan, 70 percent magenta, 70 percent yellow, and 70 percent black to make a neutral shadow. (Photoshop's defaults are 65 percent, 53 percent, 51 percent, and 94 percent, respectively.) When in doubt, ask your printer. Later you'll correct, or *remap*, the shadow values to match these target values.

Still Color Curious?
DeskTop Publishing Internet Jumplist has links to discussions, FAQ lists, and other resources for the insatiably inquisitive mind, at www.teleport.com/~eidos/dtpij/dtpij.html

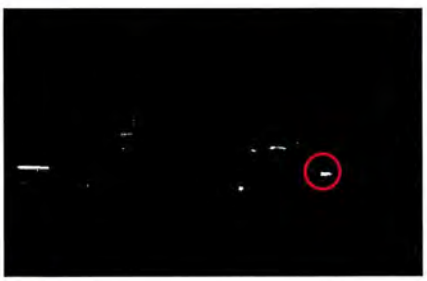
accurately (find out how in your Adobe Photoshop manual), but this approach is not foolproof.

There is a way to work around this problem — a way that doesn't require calling in the experts or setting aside months to read more Photoshop books. Photoshop's Info palette, when set to display with the same CMYK ink percentages used in printing, can help you examine your image with an objective eye. As you drag your cursor over your image, the Info palette shows how much ink of each color (cyan, magenta, yellow, and black) the press will lay down in each area. It's these numbers — rather than the colors you see on the screen — that matter.

We'll show you how to use the Info palette to measure the CMYK values of areas in your image that generally have standard values — highlights, shadows, and neutral grays. By comparing your image's values against these standards, you can quickly see if your scanner, or other source, has introduced too much of any one color. If there is a color cast, a correction in the curves should correct it throughout the image.

Once you've learned how to look at your image through the eyes of the Info palette instead of just through your own, you'll be able to correct global color casts quickly and with confidence.

Chris Lehan is an electronic prepress manager for a printing company and teaches classes in Adobe Photoshop for a technical college in Minneapolis, MN.



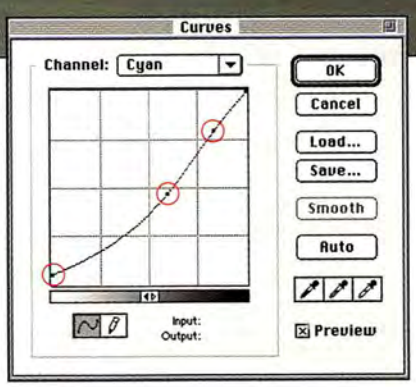
4 Examine the CMYK value of your image's lightest point.

Find the lightest part of the image by using the Threshold command again. This time, drag the slider all the way to the right until the image turns completely black. Pull the slider back to the left until the first white blotch appears. Again, place your eyedropper on a white spot and jot down the CMYK values of that area from the Info palette. (Then make sure to click on Cancel in the Threshold dialog box.) For a balanced highlight, aim for what's called a *classic* white. In our printing process, we get this result with target values of 5 percent cyan, 2 percent magenta, 2 percent yellow, and 0 percent black. (Photoshop's defaults are 5 percent, 3 percent, 3 percent, and 0 percent, respectively.) Again, it's best to ask your printer. You'll use these target values to remap your highlights in the following step.

5 Fix the color cast by remapping the curves to the proper color values.

Once you have all the actual and target values for neutral grays, shadows, and highlights, you're ready to fix the image. Give yourself room for mistakes by working on a copy (File: Save a Copy) or on an adjustment layer (Layer: New: Adjustment Layer). Then open the Curves dialog box (Image: Adjust: Curves). Begin by choosing the Cyan channel from the Channel pop-up menu. Look at the Input number at the base of the dialog box, and place a point on the curve that matches each actual cyan value you collected from your image. If you collected values in steps 2, 3, and 4, for example, you'll have three points that represent the cyan values for the actual gray, shadow, and highlight. Next, click on each point, one at a time, and drag it to the Output reading that matches the *target* value you determined. Repeat this process for the magenta, yellow, and black channels, and then click on OK. The color cast should now be eliminated, but print a color proof to check your work.





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The Anonymizer
Surf the Web without leaving a trail, via this clever Web service www.anonymizer.com

By Jason Snell
jason@macuser.com

The Wrong Side of the Net

If you're not aware of your Internet surroundings, you're likely to get mugged by the scum of the Net.

A NET-WISE PERSON is one who starts with this simple premise: Almost nothing on the Internet is private or secure. Take e-mail, for example: When e-mail is sent across the Net, it's sent in an unencrypted stream of text that can be intercepted (with some difficulty) by devious hackers. When it reaches its destination, the text of your message sits on a mail server waiting for the recipient to pick it up. A nosy administrator — or anyone with access to that server — can easily read your mail, including enclosed trade secrets, credit-card numbers, or heartfelt yearnings.

Your wanderings on the Web are also about as private as a stroll down the aisles of your local convenience store: You're being watched every step of the way. Many Web servers try to use little text strings called cookies to track your movement around Web sites (see "Big Brother Meets the Cookie Monster," *MacUser*, July '97, page 96), and every time you load a Web page, your browser software sends the receiving server information about your computer type, your computer's Internet address, and what browser you're using. In addition, a growing number of businesses are using network-traffic-analysis systems to track how their employees are surfing the Web.

Danger Is Served

Although there's a disturbing lack of privacy for Net users, issues of security are even more troubling for people who are trying to run servers on the Internet. Once you set up a server on the Internet, you're asking for trouble — if there's a security hole, a hacker is almost guaranteed to find it and exploit it. Fortunately for Mac users, the Mac's graphical interface and single-user design makes the Mac an unusually difficult (but not impossible) nut to crack.



Illustration · Barbara Pollak

Just about any Mac user can set up a Web server, since Apple and Microsoft both offer personal Web-server software for the Mac. But be careful: If your server software has a bug (no program is bug-free), it could compromise your security. If your Mac contains sensitive material, think twice before turning it into your personal Web server.

The same warning about software bugs applies to Java applets appearing all over the Web these days. Java applets and JavaScript scripts are *supposed* to deny access to your personal information, but several hackers have discovered bugs in Java and JavaScript that have created embarrassing security holes.

Countermeasures

There are still ways you can protect your privacy. Using Pretty Good Privacy's PGP for Personal Privacy, which works with Qualcomm's Eudora and Claris Emailer Pro, you can transform your e-mail into a string of completely unintelligible characters that can be read only by the message's intended recipient. Although encryption used to be almost impossible to use, the latest version of PGP for Personal Privacy makes it easy. You can't use this encryption, though, unless the person you're sending mail to is also a PGP user.

Although most Web browsing involves shooting plain text across the Web, not all Web sessions have to be that risky. All major browsers offer some level of encryption, which means that the HTML pages you receive from the Web and the responses your browser sends can't be decoded (at least, not easily) by interlopers. For example, most banks and online shopping areas now provide encrypted connections, so you don't have to worry about your financial information and your credit-card number going across the Net in plain text.

When it comes to concealing your identity when you're on the Web, things are a little bit more difficult. There's very little you can do to protect yourself from your employer's gaze, but there is a way to keep the Web servers you visit from seeing your personal information. A clever Web site called The Anonymizer can act as your proxy, surfing the Web for you remotely and transmitting the resulting pages and images back to you. The only catch? You've got to wait a minute before pages load, unless you pay for The Anonymizer's Web-sanitation service ($60 per year).

Forewarned Is Forearmed

Now that I've scared the bejeezus out of you, let me let you in on the good news: Although there are bad people lurking out there on the Net and waiting to do bad things to you, that doesn't mean you should rip the modem out of your wall and kiss off the Net. I've sent my credit-card number over the Web in e-mail to buy books and CDs from reputable companies, and I haven't been ripped off yet. I'm careful about who I give my money to, and I always weigh the risks involved in using the Net against the sheer convenience of it. I keep in mind that I'm dealing with the same people who are in the real world — some are trustworthy, and others are crooks, swindlers, and charlatans. The best tactic is to rely on common sense and street smarts.

Having had his wallet and backpack stolen while walking alone at night on the UC Berkeley campus, Macworld *Senior Associate Editor Jason Snell sticks to well-lighted and populated footpaths.*

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By John Rizzo
smartuser@macuser.com

Timely Mac Tune-ups

Open up your calendar and jot down these headache-saving tricks

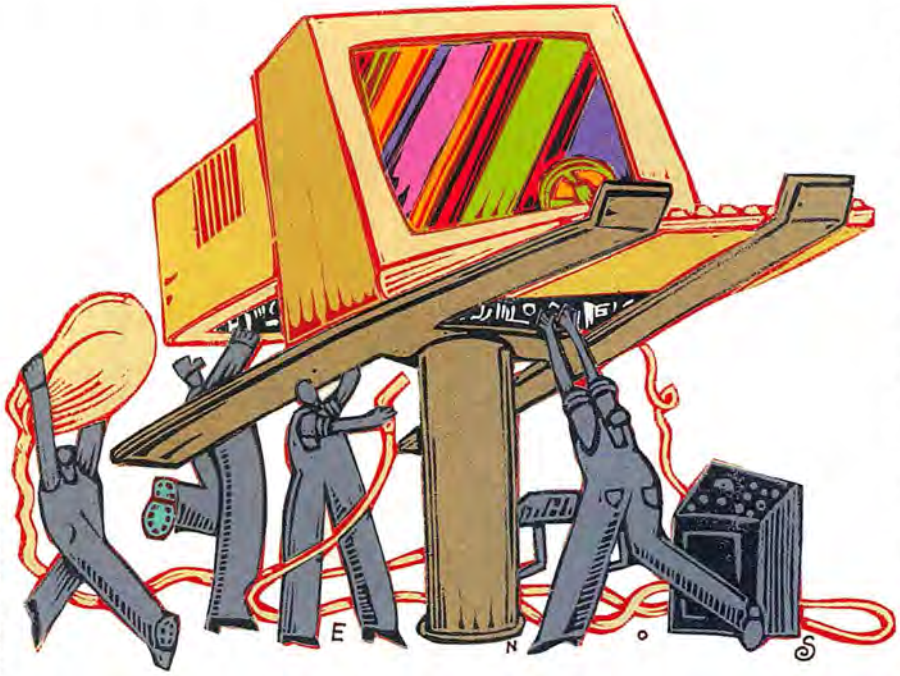


Illustration · Randall Enos

IF THERE IS ONE THING to remember about Mac maintenance, it's that you should forget the old "if it ain't broke, don't fix it" philosophy. It's much easier to fix your Mac before it breaks. Timely maintenance, despite the effort involved, is far easier than repair of a dead Mac. We've put together a set of maintenance tasks, tools, and timing tips that will keep your Mac running smoothly.

Before You Tune Up

Above all, back up irreplaceable data before performing maintenance activity on a hard drive. There's always the chance that power failures or interruptions during a routine tune-up session will result in tragedy. You can use a backup program, such as Retrospect ($249 list), from Dantz Software, to automate this task, or you can simply copy your files to other disks manually.

One thing to remember is that most popular removable storage media, such as Iomega's Zip and Jaz cartridges, are not designed for archival data storage, although they're perfectly fine for a short time. For archival purposes, we recommend hardier optical media, such as CD-ROMs or magneto-optical discs. Don't store a Zip backup for more than two or three years. It's also a good idea to reformat (and update the drivers on) removable media, such as Zip, Jaz, or SyQuest cartridges, every year or two.

Frequent Tune-ups

With its uniquely complex combination of mechanical, electronic, and magnetic systems, the hard drive is likely to be a source of problems. Safeguarding your data requires making adjustments often. For most people, a monthly tune-up will pluck the seeds of crash-causing problems before they sprout. However, people who move large amounts of data may want to run utilities as frequently as once a week or — if you're running a professional Web server — even daily.

Rebuild the Desktop The first (and easiest) of your monthly tasks involves the Desktop Database, a set of invisible files that list your icons and some directory information. Rebuilding this database prevents the loss of files and keeps icons from turning generic. You can rebuild the desktop by holding down the Command and Option keys while restarting the Mac, but if the Desktop database is damaged, this method will yield only an updated but still corrupted desktop. One free utility, Micromat Computer Systems' TechTool (available from www.macdownload.com), reconstructs the Desktop database from scratch.

Repair Invisible Files Two other important (but invisible) files — the Volume Information Block and the volume's directory information — on the hard disk can be damaged without your realizing it. If you check these files every month, you may sidestep a vicious cycle of crashing.

You can find and fix some invisible-data problems with Apple's Disk First Aid — located in the Utilities folder of your Mac OS system disk — or with Norton Disk Doctor ($99 list, part of the Norton Utilities for Macintosh package, from Symantec). Norton Disk Doctor is able to fix some invisible-file problems that Disk

FWB Software
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650-482-4800
www.fwb.com

Aladdin Systems
Watsonville, CA
408-761-6200
www.aladdinsys.com

Crash, Don't Burn
What type of backup medium suits you best? Check out our article on backup methods. You can find it in the MacUser Archives, at www.macuser.com

First Aid can't.

When checking for problems, you should boot your Mac by using the floppy disk or CD-ROM containing either utility. To start up from a CD-ROM, hold down the C key on an Apple Mac or Command-Option-Shift-Delete on a Mac clone.

Optimize the Hard Disk Another common malady is file fragmentation, a condition in which the system stores broken chunks of files all over a disk or volume. There's no way to avoid this; the more files you move on and off the disk, the quicker it fragments. When a large enough percentage of a volume becomes fragmented, hard-drive performance drops and wear and tear on the drive's stepper motor (which moves the read/write heads in search of data on the platters) increases.

Norton Utilities' Speed Disk and FWB's Turbo ToolKit ($79 list) can each analyze a volume, tell you how fragmented it is, and give you the option of defragmenting it and sorting out the files (a process known as optimization). You should defragment a volume when more than 5 percent is in fragments — this operation can take as little as 20 minutes on a 2-GB drive. It's a good idea to get rid of files you don't need before optimizing. In order to optimize your startup volume, you'll need to boot from a different disk.

Defragment RAM Your Mac's RAM also fragments anytime you open or close applications. Fragmented RAM is wasted and can slow performance or crash the machine. The only way to fully defragment RAM is to restart your Mac, so unless you keep the same applications open all the time, it's a good idea to restart from time to time to clean up the RAM.

Thrice-Yearly Tasks

Remove Old Extensions Older extensions, control panels, and invisible files installed by software you no longer use can also cause problems. Use the Extensions Manager at least every four months to disable extraneous extensions. You can Option-click on the Name pull-down menu of Find File to search for files based on visibility criteria.

Move Old Files Those files cluttering your disk can slow your drive if less than about 10 percent is empty. Move old files to removable media if the disk is getting full. You can automate this task with FWB's Storage Wizard ($79 list), which you can configure to move or delete files as they age or if free space drops below a predetermined level.

Aladdin Systems' Spring Cleaning ($70 list) removes unused files, old fonts, and duplicate documents and performs a variety of cleanup tasks, but you can also simply use Find File to search for items whose names are duplicated.

Annual Checkups

Scan for Bad Blocks Every six months, you should check for bad blocks — small spots on your drive's platters that lose the ability to hold data. The only surefire fix is to reformat the volume, but it's not the only solution.

One workaround for bad blocks (on a disk you're not ready to format, for example) is to prevent your drive from writing data to them. Apple Drive Setup can check for bad blocks. FWB's Hard Disk ToolKit ($199 list) and Norton Utilities' Disk Doctor can also tell your drive to skip over particular blocks.

Update System Software System files aren't immune to corruption, so reinstalling fresh, clean system software regularly can make your Mac run smoother. A good time to do this is when Apple issues its annual revisions and bug fixes for the Mac OS. You should always update your hard-disk driver with the latest version of Drive Setup first. Also update extension and control panels for third-party hardware, such as graphics cards and graphics tablets.

Time to Get Started

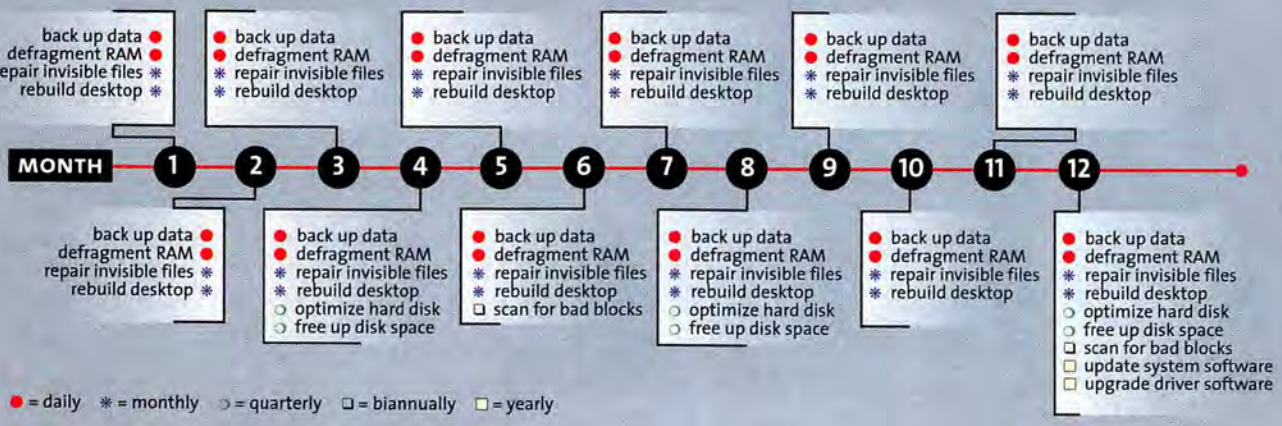
It may seem odd to go to such efforts when your Mac seems to be running fine, but data corruptions, slow-downs, and crashes happen without warning. Committing to a maintenance schedule may be just what you need to do to prevent these problems.

MacUser *Contributing Editor John Rizzo is author of* How Macs Work.

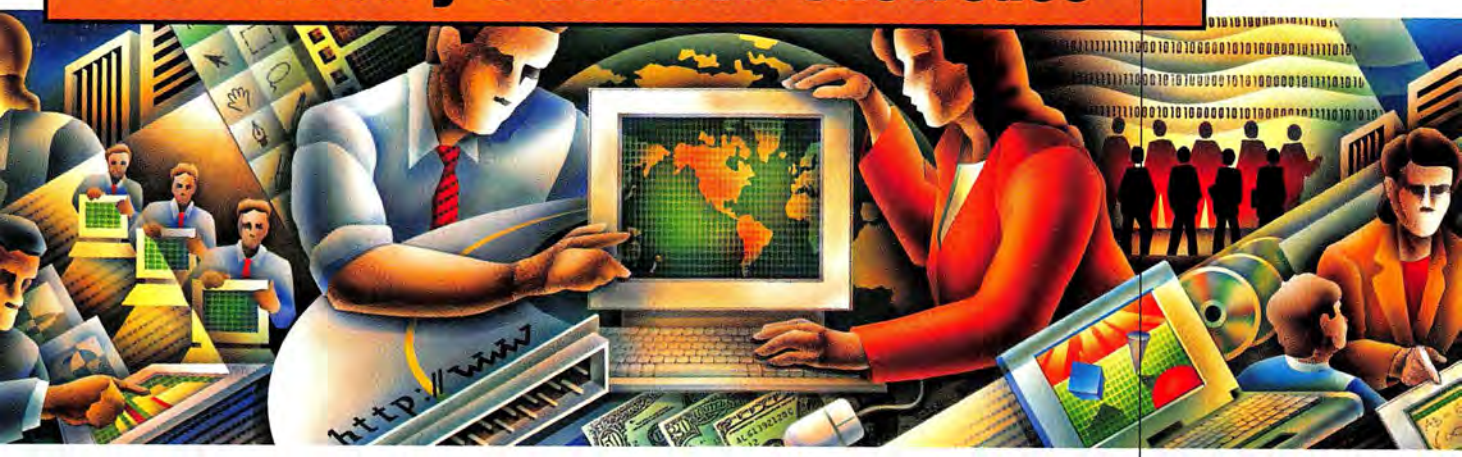
Maintenance Timeline

For the calendar year starting right now, here's a reasonable schedule for keeping your Mac in tip-top shape. Following a regular regimen of Mac tune-ups will help you avoid crashes and loss of data and will help keep your drive speedy.

You may need to make a few adjustments to our timeline according to the type of work you do. And you may want to add reformatting your disk every couple of years. We left it off because the gain for such a labor-intensive task is questionable. See the main text of this article for instructions on performing each of the tasks on the timeline.



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Illustration - Bob Staake

By Bob LeVitus and Christopher Breen

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Help Folder

The big OS switch and Web Addresses 101

A Fateful Date with OS 8?

Although I have generally enjoyed your coverage of the Mac OS 8 release, you (and all other reviewers) have forgotten one issue: How smooth is the upgrade transition?

T. Devries, via the Internet

Bob: Moving from Mac OS 7.x to 8.x isn't as extreme as, say, making the upcoming transition to Rhapsody will be. It isn't even as bad as the move from System 6 to System 7 or the swap from 680x0 processors to the PowerPC. Those hardest hit by the move to Mac OS 8 are users without a 68040 or PowerPC. OS 8 won't run on their machines at all.

We've received reports that some Macs — notably clones — refuse to boot from the OS 8 CD-ROM. The problem is that not all third-party CD-ROM drives are supported by Apple. If you have a clone that shipped with FWB's CD-ROM ToolKit, for example, use CD-ROM ToolKit's driver instead of Apple's.

Chris: If your Mac still won't start from the CD-ROM, boot from your hard disk, use the Startup Disk control panel to select the CD-ROM as the startup volume, and restart.

Another trick for getting the CD-ROM to boot is to turn on AppleTalk; restart with the Delete, Option, Command, and Shift keys held down at startup (or the "C" key, if that's how your Mac boots from a CD-ROM disc); and then mash down the Shift key once the happy Mac appears. I've also managed to install OS 8 without booting from the CD-ROM at all — just start up from your hard disk, run the OS installer, and ignore the warning messages.

Of course, I wouldn't have been so cocky about doing it this way if I didn't have a good backup at the ready in case things turned sour. Which leads me to this: Because there's always a danger of something going wrong when performing a system-software upgrade, you should be sure to have an up-to-date backup of your data before you install the new system. 99,999.2 times out of 100,006 you won't have problems that result in data loss [*Lawyer's disclaimer: These statistics are presented as humorous hyperbole only and in no way reflect reality.*], but if you're one of the 6.8 individuals whose data disappears due to a bollixed installation, you'll be relieved to have a copy.

Bob: When you do the installation, perform a clean install. You've probably got a bunch of stuff cluttering up your old System Folder. Give your Mac a break, and start fresh. Trust us, it's the best way.

It used to be that clean installations were treated as a deep, dark secret. No longer. In OS 8, you'll find the Clean Install option on the second screen of the OS 8 installer. Once you've got your new OS running smoothly, don't screw it up by tossing all your old extensions and control panels into the new System Folder at once. Be patient. Try one, restart your Mac, and see how it works. If your Mac seems all right after a few hours of normal operation, try another. Repeat as necessary. By using this slow and patient method, you'll have a better idea of where to look for the culprit if things start to go wrong.

Finally, with OS 8, ObjectSupportLib is built into the Mac's system software — eliminating the need for an extension. One problem is that some programs don't realize this and install their own, older version of ObjectSupportLib, which can cause conflicts. If you're installing software that's not OS 8-approved, check for redundant copies of this extension. Hopefully, patches for these programs will be available by the time you read this.

Chris: Now to the help resources: We've invoked their names before, and we'll do it again — Ric Ford, of *MacWEEK* fame, and Ted Landau, author of *Sad Macs, Bombs, and Other Disasters* (Peachpit Press, 1997), maintain two of the best Mac troubleshooting resources we know of. Ric's MacInTouch Website, like his *MacWEEK* column, contains a wealth of information regarding Mac quirks and incompatibilities. Ted's MacFixIt site, likewise, lists Mac problems and offers workarounds when they are available.

Ric and Ted both have OS 8 compatibility pages. You'll find Ric's at www.macintouch.com/m8compat.html and Ted's at www.macfixit.com/reports/macos8.0.shtml. I've bookmarked both sites and visit them regularly, which is one of the best ways to get the most-up-to-date tips for Mac OS 8.

If you're looking for an interactive resource — one where you can submit questions to a knowledgeable group of Macintosh users — try the MacManagers list (www.mrmac.com/mac-mgrs.html). To subscribe to the MacManagers digest, contact majordomo@lists.cerf.net.

Web-Address Shorthand

***MacUser*'s Website can be reached by typing "www.macuser.com" but its real URL is www.zdnet.com/macuser. How can I have a short address instead of a long one for *my* Web site?**

Kyle Wyatt, via the Internet

Chris: Thanks to the help of *MacUser*'s Net Guru Jason Snell, I can report that when you type "www.macuser.com" (or just "macuser") in the Netscape Navigator or Internet Explorer address field, you are indeed transported to a server assigned to the www.macuser.com address. What you don't see is that you are then redirected from that server to the server bearing the www.zdnet.com/macuser address (which, if you must know, may be the same server, since UNIX servers can carry multiple IP addresses). But *why* does *MacUser* do that, Bob?

Bob: Who cares? That's the way it works, and it's hardly the business of lowly columnists like us to ask why.

Chris: The benefit of having a shorter address becomes apparent if one's Web address is something like www.mooseinmybackyard.ab.ca.com/userswithnohair/billybob/. A simple www.billybob.com would spare the rest of us a lot of typing.

Bob: Kyle, if your conscience allows — and I'm not saying one way or the other

Apple's Official Line
Download the latest updates and additions to your copy of OS 8 from Apple, at www.macos.apple.com

Mac Download
To download the shareware mentioned in this article, go to www.macdownload.com

that mine does — you could recommend that people who visit your home page use Microsoft's Internet Explorer (IE) version 3.01 or later.

Chris: That's because IE has a relevant feature that Netscape Navigator doesn't: Autofill. All someone has to do is bookmark your page in IE (Command-D), highlight the bookmark's name in the Favorites list, and press Command-I.

Bob: Once you've entered a unique name such as Billybob in the Name field of the Favorites dialog box, whenever you want to revisit Billybob's homepage you can either pick it from the list of Favorites or simply start typing the word *Billybob* in IE's address field. After you've typed a letter or two, the Billybob site will leap into the address field.

Chris: My inner cheapskate-child likes this solution even though it involves a Microsoft product. But suppose you're still interested in having hits redirected from an easier address. What you need is a domain name of your very own, and to get one, you have two options: The Easy and Expensive Path and the Probably Harder but Cheaper Path.

The Easy and Expensive Path earns its name by virtue of the fact that you'll be paying someone else to do the dirty work. Here's how it works: Call your ISP, and ask them to set up a domain name for you. You're welcome to suggest a name for your domain, but have several in mind in case your first few choices are already taken. Your ISP will relieve you of anywhere between fifty and a hundred bucks for the service and let you know when your domain is established. Once the domain is in place, the ISP will redirect hits for the new domain to your incredibly long address. Now all your visitors need to do to be routed to your homepage is type "Billybob" in their browsers.

The Probably Harder but Cheaper Path requires that you be able to work your way through UNIX or know some UNIX-geeks who owe you a big favor. For $50 a year, you can register your own domain with InterNIC (http://rs.internic.net). Once you have registered the domain name, it's time to either dive into UNIX yourself or stock up on pizza and beer to pour into the friends who'll take that dive on your behalf.

Show Thyself, Invisible Knave!

Once I find invisible files, how do I get rid of them? I tried to drag a corrupted invisible file to the trash, but my Mac won't allow me to delete invisible files.

Wes Butterfield, Cedar Rapids, IA

Chris: To search for invisible files, just launch Find File and press the Option key while clicking and holding on the "name" pull-down menu.

Bob: Good tip, but Wes is right, it doesn't go far enough. Before we tell you how to make the files visible, Wes, we've got to warn you: Invisible files are usually invisible for a good reason. They're not intended to be messed with. Tossing out or changing invisible files can bring you grief, large and small.

Chris: Now that we've scared the bejeebers out of you, we can reveal that there are a few utilities capable of revealing the Great Unseen. Our old friend ResEdit, from Apple, is one of them.

When you launch ResEdit, select Get File/Folder Info from the File menu. Navigate in ResEdit's dialog box to the file, highlight it, and click on the Get Info button. You're rewarded with a dialog box that contains a checkbox labeled Invisible. Uncheck it, close the Get Info box, and click on Yes to save the change. The file is now visible and can be tossed.

Bob: Did I hear someone whimper: "But, Chris, ResEdit *scares* me! Isn't there something else I could use?" Of course there is. Just go to MacUser's download site and search for Daniel Azuma's FileTyper. Like ResEdit, FileTyper lets you open invisible files and change the visibility attribute on any file. It does a whole lot more, of course, and is well worth the $10 shareware fee.

Chris: And did I hear someone complain, "But, Bob, you forgot to mention Evan Gross' The DiskTools Collection, a $20 suite of shareware utilities, one of which, DiskTools, can also reveal and delete invisible files?"

Bob: Or "You left out Laurence Harris' amazing shareware utility, File Buddy, which also lets you modify file visibility."

Chris and Bob, in unison: No, we didn't!

A/ROSE by Any Other Name

There is a file in my Extensions folder on my old Macintosh IIvx called A/ROSE that seems to be modified quite frequently. Once, I removed it without any problems, but replacing it made everything run a lot more smoothly. What is the purpose of this extension?

Casey Lewis, via the Internet

Chris: You know, that's been bugging me lately too. I have that file on several disks —have had it for years — and can't for the life of me remember where it came from.

Bob: You're not alone. It was installed with several versions of System 7, although most machines didn't need it. It's been removed from Mac OS 8.

Apple says A/ROSE stands for Apple Real-time Operating System Environment. It's an extension that allows communication between your computer's main logic board and certain NuBus cards: the Apple Token Ring 4.16 NB card, the Apple Serial NB card, and the Apple Remote Access 2.0 MultiPort Server card.

Chris: And let us not forget the Coax/TwinAx NB card.

Bob: If you don't have one of the aforementioned cards, you can trash A/ROSE.

Chris: One last thing: If you don't have one of those cards, that stuff about how "replacing it made everything run a lot more smoothly" was probably a figment of your imagination. A/ROSE doesn't do anything unless a card that requires it is present at boot time.

Bob LeVitus is the author of Mac OS 8 for Dummies *and is the Mac columnist for the* Houston Chronicle. *Christopher Breen recently coauthored* The Macintosh Bible Guide to Games, *published by Peachpit Press.*

Reader Tip · *Netscape Enhancer*

E-mail Alternative

Unlike Microsoft's Internet Explorer, Netscape Navigator and Communicator don't let you pick an alternate application to send e-mail. But, with this AppleScript you can. It will automatically launch Eudora when you click on an online e-mail address or when you press Navigator and Communicator's To: Mail button. In Script Editor, type:

```
tell application "Netscape"
      register protocol
"CSOm" for protocol "mailto:"
      Activate
end tell
```

Although this script works beautifully for Netscape 2.x., Netscape 3.0's Preferences file was changed in such a way that the script's effects don't always "stick" across restarts. On my Web site, I offer a variety of ways for making the script stick. Check out http://www.amherst.edu/~atstarr/eudora/eudorawithnetscape.html.

Andrew Starr, via the Internet

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By Andy Ihnatko
andyi@macuser.com

Greatly Insane

Inside the mind of Steve Jobs

A DESPERATE CHASE is underway. The boots of dozens of shock troops pound the passageways of a vast gray techno-industrial complex. Their quarry: a woman of Nordic features, bearing a 20-pound sledge, dressed in a colorful tank top and red shorts.

She glides through one final passageway and finds herself at her destination: the Hall of the Word, in which the zombified citizenry sit mutely in front of an enormous video screen from which Big Brother is feeding them their latest dosage of The Will of the Masses.

Grim determination ripples across the woman's face as she slips her hands through the strap of the sledge and begins to spin . . . Once! Twice! A third time, not even noticing that the troops have finally caught up to her.

She lets the hammer fly. Time bends to the import of the moment, as the hammer spends an eternity in flight until . . . *until!* It smashes into the screen!

. . . And ricochets straight back, making a coconut-like sound as it clonks off her head, leaving her splayed on the concrete floor with little cartoon birdies circling her blond locks. The shock troops look at each other and shrug and then head back to the break room for a Fresca, while the Masses remain, unaffected by a commotion they barely noticed.

Yes, that's what we've been left with, ladies and gentlemen. Our glorious revolution is not quite so glorious as it appeared in the brochure, and for good reason: We have become our own worst enemy.

Wait, hang on there . . . when the hell did *I* screw anything up? I've been doing my damnedest to *support* the Mac! And what about you folks? You were out there fighting the good fight along with me, sometimes hauling buckets of paint to concrete bridge abutments to support the Cause! Why am I laying any sort of guilt trip on *you?* It's all Steve Jobs's fault!

Who shoved out technology czar Ellen Hancock, one of Apple's best and brightest? Who pulled the plug on licensing? Worse, who engineered the move in such a way as to ensure maximum ill will with the rest of the marketplace and maximum exposure to FTC violations? Who (as is rumored at this writing) is pulling the plug on the PowerPC, arguably the most powerful and flexible processor on the market today? Who's been making pronouncements without defining the stratagems behind them, thereby causing an already unsympathetic press to frighten the herd even more? Who pressured Red Sox manager John McNamara to keep Bill Buckner there at first base for the final out of Game 6 of the 1986 World Series? I've got my suspicions.

Jobs's announcements at Macworld Expo last August now seem like canny positioning. Microsoft isn't the enemy, he was saying. That's all over, he encouraged us to believe; let's put it all behind us and move forward to new things. Because, apparently, Jobs decided that if he can't be as rich or powerful as Bill Gates, he can at least try to become as hated, as important a scapegoat for the Mac community. Indeed, those of us who really do read *Playboy* for the articles find plenty of irony in Jobs's 1985 interview: "There were two key reasons we chose to bet our company on not doing that [building IBM clones]: The first was that we thought — and I think as history is unfolding, we're being proved correct — that IBM would fold its umbrella on the companies making compatible computers and absolutely crush them."

Fortunately for Power, Motorola, and the rest of the companies that — under Gil Amelio's tenure — invested heavily in their belief that licensing for Mac OS 8 and CHRP certification was a slam-dunk, Apple's in no shape to crush anything but itself at this point. But while Jobs hasn't *completely* become that which he once despised, it's close enough for us.

So *has* Steve Jobs gone nuts? Of course not. I, for one, believe the basic notion that Apple was ultimately being hurt by licensing. Further, by bringing Power Computing's marketing arm on board, Apple has taken a great leap toward solving what's historically been Apple's biggest problem: putting a Mac in the hands of everyone who's lined up to pay for one. I think Jobs eased out a lot of Apple staff who would have been great assets to Apple, but I can see the advantages of bringing people up from NeXT. As for the rest of the rumors, well, they're just rumors, and the good thing about rumors is that you can safely stick your fingers in your ears and shout "I'm not *listening* I'm not *listening*" over and over again whenever someone tries to tell you one that frightens you.

No, more likely this is all some sort of brilliant '90s-style marketing strategy. Jobs knows that the fuel that powers the 10,000-horsepower engine of the Macintosh Faithful is a target for our hatred of bonehead corporatism. In an event as rigged as the Hulk Hogan/Randy Savage wrestling championship match, Jobs will soon name a CEO to play Good Cop. Faith and confidence will be restored, and the Technology Group will be free to continue burning up money on the HoverCar project.



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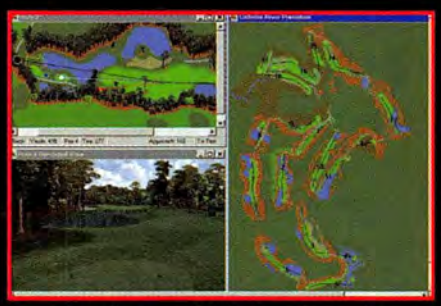
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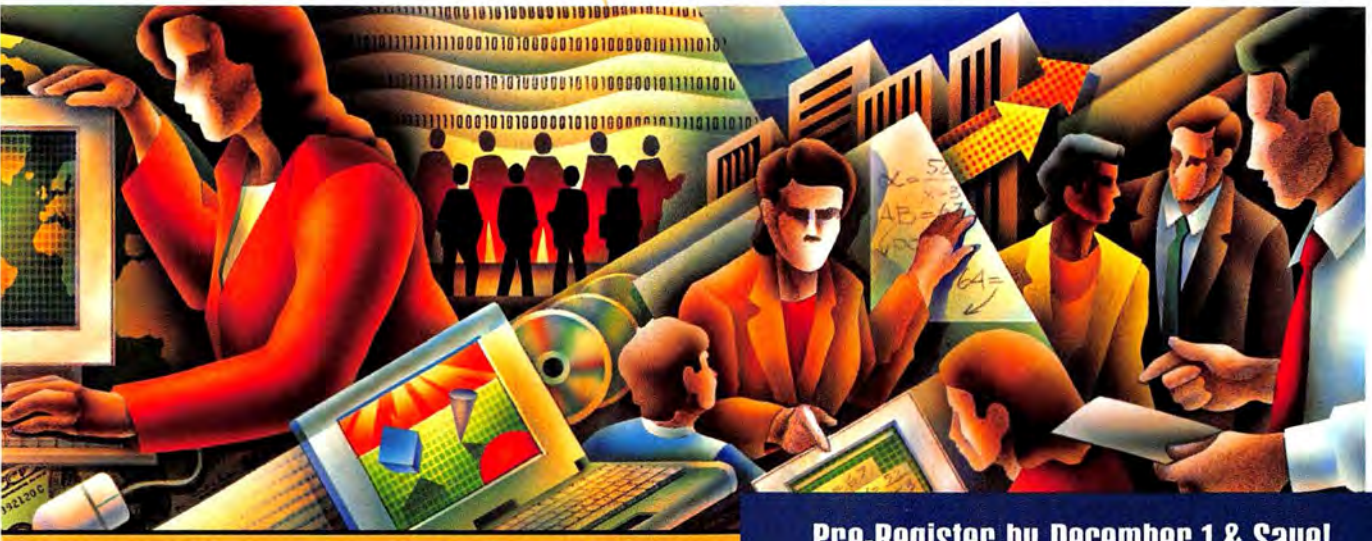
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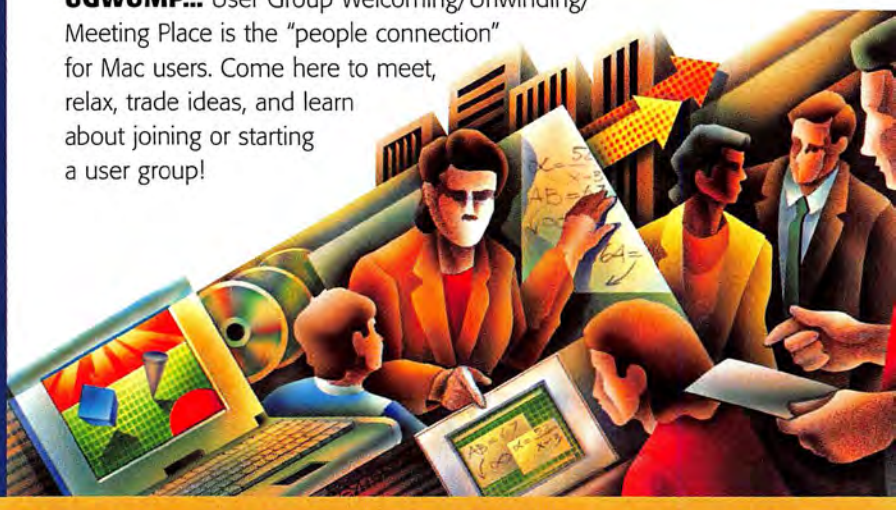
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The unique power of the Macintosh lives in its Operating System and Extensions. Learn how to harness that power, extend and protect it with third-party additions, manage your computer for better productivity, and build fast, easy-to-use networks for printing and sharing files and using the Internet. Topics include:

• Essential Network Management Tools in a Cross-Platform World • Justifying Macs in a PC Environment • Virus Protection, Security, and Privacy • Running Macs with NT Servers • System Folder Explained • Supporting High-Speed and High-Utilization Networks • Running Macs with Novell • Mobile Computing on Macs: New Tips for Road Warriors!

H. The Small Office/Home Office (SOHO) Track

Never before has it been easier – or more fun! – to launch and operate a small company, a home-based business, or a home office for telecommuting. Hear experts share their insights on how YOU can increase productivity and slash costs! Topics include:

• Putting Your Small Business on the Web • The Joy of Working at Home • Getting the Most from the 'Net for Your Small Business • Working Solo: Success Secrets • Using the Latest and Greatest to Run Your Small Business

I. The Educator Track

An excellent opportunity for educators, administrators, and students to show and be shown new and classic examples of how the Macintosh positively shines as a teaching tool. Topics include:

• Maintaining Sanity and Productivity within Your Computer Lab • Teaching How to Use the Web Safely • Solving Your Classroom Computer Nightmares • Building a Curriculum-Based Intranet • Cool Computer Curriculum Projects! • How to Build a Classroom Using eMate

J. BACK BY POPULAR DEMAND: The Programmer/Developer Track

For in-house developers, veteran independents, and novice Mac techies alike: the hottest breakthroughs and innovations, plus solid advice from eminently reliable sources. Topics include:

• Rhapsody Tips for Developers • Adventures in AppleScript • LET'S MAKE A DEAL! (Financing How-To's for Developers) • How to Become a Macintosh Programmer • Beginner Java • Beyond Beginner Java • Java Beans • Developing with WebObjects

K. The Tools Workshops

Intensive training sessions on some of the most popular Macintosh tools, presented in a totally non-biased format by the award-winning staff of MacAcademy.

• Mastering the Macintosh: Intermediate to Advanced • Claris Works • Adobe PageMill • Adobe Photoshop • QuarkXPress • Macromedia Director

L. The Special Interest Group Track

Sessions for "birds of a feather" looking to compare Mac notes with others in a similar setting – to solve special problems, to see how colleagues across the continent are getting more mileage out of the Mac, and to develop an invaluable "user network."

• Macs in the Law Office • Macs in Science and Technology • The MACWORLD Expo User Group Extravaganza (MUSE)

M. The You-Asked-For-It Track

A combination of perennial MACWORLD Expo favorites, plus brand-new topics in response to your special requests, with up-to-the-minute market developments. For starters:

• Mac Tune-up Clinic • Getting Started with WebObjects • Getting Started with HTML

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PRE-REGISTRATION DEADLINE IS DECEMBER 1!

Please choose your package and fill out the form completely. Incomplete forms will be returned. Please use one form per person; make photocopies for additional people.

All Conference and Keynote Sessions are on a first-come, first-served basis, with the exception of the Macworld/Pro Full-Day Workshops.

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- Confirmation of your registration will be sent to you once your registration is processed. Pre-registration deadline is December 1, 1997.
- U.S. & Canadian Badges: will be mailed after December 22.
- International Badges: (excluding Canada) will be held on-site at the Pre-Registered Attendee Counter in the North Lobby of the Moscone Convention Center.
- Registration Hours: January 4, 12:00 p.m. - 5:00 p.m.; January 6-8, 8:00 a.m. - 6:00 p.m. and January 9, 8:00 a.m. - 4:00 p.m.

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❑ 5. Arts & Entertainment
❑ 6. Computer Reseller/VAR/VAD/Service
❑ 7. Consulting
❑ 8. Education
❑ 9. Engineering/R&D
❑ 10. Government/Military
❑ 11. Health/Medical Services
❑ 12. Legal Services
❑ 13. Manufacturing (Computer Industry)
❑ 14. Manufacturing (Non-Computer Industry)
❑ 15. Marketing/Sales/PR/Communications
❑ 16. Printing/Publishing
❑ 17. Transportation
❑ 18. Utilities
❑ 19. Other_____

WHAT IS YOUR JOB FUNCTION? (Check One Only)
❑ 20. Art Director/Graphics
❑ 21. Consultant
❑ 22. Controller/Treasurer/Accounting/CFO
❑ 23. Corporate Executive
❑ 24. DP/IS Management/CIO
❑ 25. Editorial/Writing
❑ 26. Educator
❑ 27. Engineering/Scientific/R&D
❑ 28. Human Resources
❑ 29. Management/Department Head
❑ 30. Marketing/Sales
❑ 31. Network Management
❑ 32. Professional (Lawyer, Doctor, etc.)
❑ 33. Programming/Analysis
❑ 34. Purchasing
❑ 35. Software Developer
❑ 36. Training
❑ 37. Other_____

WHAT IS THE SIZE OF YOUR ORGANIZATION?
❑ 38. Under 50
❑ 39. 50-99
❑ 40. 100-499
❑ 41. 500-999
❑ 42. 1000 & Over

WHICH PERSONAL COMPUTERS DO YOU USE? (Check all that apply)
❑ 43. Macintosh Powerbook Series/Duo Series
❑ 44. Macintosh II Series
❑ 45. Macintosh Performa Series
❑ 46. Macintosh Centris Series
❑ 47. Macintosh Quadra Series
❑ 48. Macintosh Workgroup Series
❑ 49. PowerMac
❑ 50. Newton
❑ 51. Mac clone
❑ 52. IBM PC or compatible desktop
❑ 53. IBM Laptop/Notebook
❑ 54. Other_____

HOW MANY MACINTOSH COMPUTERS ARE USED IN YOUR ORGANIZATION?
❑ 55. 0
❑ 56. 1-10
❑ 57. 11-25
❑ 58. 26-50
❑ 59. 51-100
❑ 60. 101-500
❑ 61. 501+

ARE THE COMPUTERS AT YOUR ORGANIZATION NETWORKED?
❑ 62. Yes
❑ 63. No

WHICH APPLICATIONS DO YOU OR YOUR ORGANIZATION UTILIZE? (Check all that apply)
❑ 64. Accounting/Finance
❑ 65. Agenda Minder/Scheduler
❑ 66. CAD/CAM
❑ 67. CASE Tools
❑ 68. Database
❑ 69. Desktop Publishing
❑ 70. Digital Video
❑ 71. Education
❑ 72. Graphics
❑ 73. Multimedia
❑ 74. Project Management
❑ 75. Spreadsheet
❑ 76. Word Processing

WHICH (IF ANY) OF THESE SERVICES DOES YOUR ORGANIZATION UTILIZE? (Check all that apply)
❑ 77. America On-line
❑ 78. AT&T
❑ 79. CompuServe
❑ 80. Prodigy
❑ 81. Other_____

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49	Auto-des-sys	49	—
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Macworld

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1a. For which of the following Mac-related products do you specify, recommend, approve, purchase or influence the purchase?

1b. Which of the following do you plan to purchase in the next 12 months? (Check all that apply.)

	Purchase Involvement		Plan to Buy
Desktops/PowerBooks	○	1	○
Monitors	○	2	○
Printers	○	3	○
Storage Devices	○	4	○
Networking/Data Communications	○	5	○
Internet/Intranet products/services	○	6	○
Software: business/productivity	○	7	○
graphics/design	○	8	○
interactive publishing/ multimedia	○	9	○
entertainment	○	10	○
education	○	11	○
other software	○	12	○
Any other products	○	13	○

2. Are you employed, and involved in purchase decisions for 5 or more Macs? ○ Yes (1) ○ No (2)

3. What's Your Opinion?

What are your main frustrations in making Mac-related purchase decisions?

- ○ 1. Lack of expertise in assessing products
- ○ 2. Difficulty in installing or using products
- ○ 3. Too many choices
- ○ 4. Not enough choices
- ○ 5. Unclear needs
- ○ 6. Concern that cheaper, better products are about to come out
- ○ 7. Other (please specify) __________

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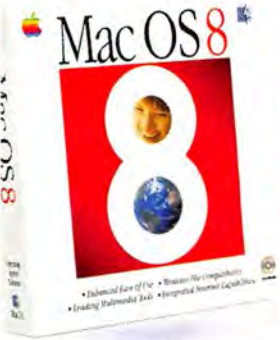
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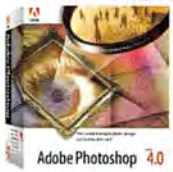
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Seagate Medalist	(ST52160)	2.1GB	128K	9 MS	5400	Ultra SCSI	245	N/A
Western Digital	(WDAC2100)	2.1 GB	512K	8MS	7200	Ultra SCSI	335	345
Quantum Atlas 2	(32275)	2.2 GB	512K	8MS	7200	Ultra SCSI	325	335
Seagate Barracuda	(ST32272)	2.2 GB	512K	8MS	7200	Ultra SCSI	525	570
Seagate Barracuda	(32550)	2.2 GB	512K	8MS	7200	SCSI 2	325	345
Quantum Viking	(322275VK)	2.2 GB	512K	7.9MS	7200	Ultra SCSI	365	375
IBM UltraStar	(DCAS32160)	2.1 GB	512K	8MS	5400	Ultra SCSI	265	315
3.2 GB DRIVES								
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Quantum Stratus	(43320)	4.3GB	128K	9 MS	5400	Ultra SCSI	349	N/A
IBM UltraStar	(DCAS34330)	4.3 GB	512K	8MS	5400	Ultra SCSI	385	435
Fujitsu	(2954SYU)	4.1 GB	512K	8MS	7200	Ultra SCSI	435	535
Western Digital	(WDAC4300)	4.3 GB	512K	8MS	7200	Ultra SCSI	545	595
Micropolis	(M3243)	4.3 GB	512K	7.5MS	7200	SCSI 2	455	475
Micropolis	(M4345)	4.5 GB	512K	7.5MS	7200	Ultra SCSI	555	575
Micropolis	(M4345WAV)	4.5 GB	2048K	7.5MS	7200	Ultra SCSI	N/A	595
Quantum Viking	(34550VK)	4.5 GB	512K	8MS	7200	Ultra SCSI	485	535
Seagate Cheetah	(ST34501)	4.5 GB	512K	7MS	10000	Ultra SCSI	765	789
Seagate Barracuda	(ST34572)	4.5 GB	512K	8MS	7200	Ultra SCSI	645	699
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Micropolis	(M3391)	9.1 GB	512K	7.9MS	7200	Ultra SCSI	889	949
Micropolis	(M3391WAV)	9.1 GB	2048K	7.9MS	7200	Ultra SCSI	N/A	999
Quantum Atlas 2	(39100)	9.1 GB	1024K	8MS	7200	Ultra SCSI	889	989
Seagate Barracuda	(ST19171)	9.1 GB	512K	7.5MS	7200	Ultra SCSI	999	1045
Seagate Cheetah	(ST19101)	9.1 GB	512K	7MS	10000	Ultra SCSI	1219	1249
Fujitsu 9 GB	(2959)	9.1 GB	512K	8MS	7200	Ultra SCSI	875	935
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Sony 9000 DD3 SPECIAL PRICE!	24GB	120 Mb/Min.	1169
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DLT™ 4500	200GB	180 Mb/Min.	6485
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Toshiba 12x CD Rom	169
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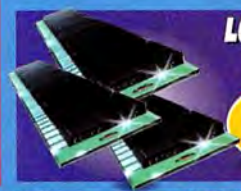
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2.2GB Viking	QM32275VKS	8ms	7200	$399	$449
3.2GB Stratus	QM33240STS	10ms	5400	$299	$349
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4.5GB Viking	QM34550VKSW	8ms	7200	$549	$629
4.5GB Atlas II	QM34550ALW	8ms	7200	$619	$699
9.1GB Atlas II	QM39100ALW	8ms	7200	$919	$999
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3.2GB Stratus - IDE	QM33240STA	10ms	4500	$239	----
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4.5GB Cheetah	ST34501N	8ms	10000	$779	$829
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9.1GB Cheetah	ST19101N	8ms	10000	$1249	$1299
23.4GB Elite 23	ST423451N	8ms	5400	$2099	$2199
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4.5GB Barracuda 4XL	ST34572W	8ms	7200	$729	$809
4.5GB Cheetah	ST34501W	8ms	10000	$799	$879
9.1GB Barracuda 9	ST19171W	8ms	7200	$1149	$1229
9.1GB Cheetah	ST19101W	8ms	10000	$1299	$1379
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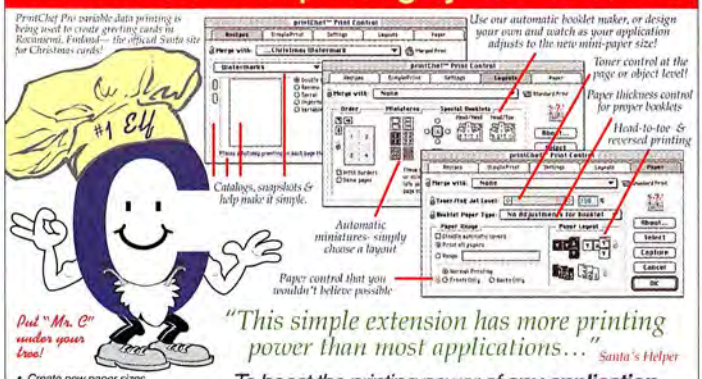
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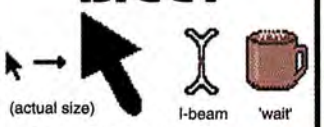
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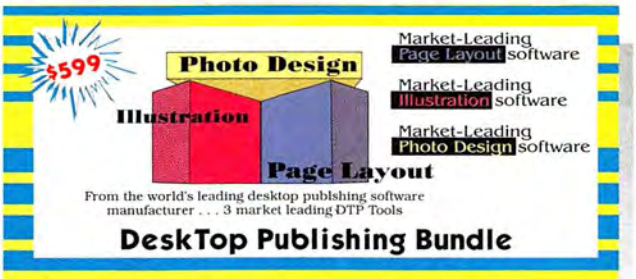
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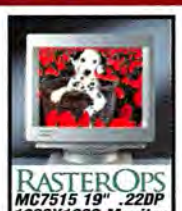
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Hitachi	Superscan MC20	1325
Iiyama	VisionMaster Pro 21	1469
La Cie	Electron 21"	1539
Mitsubishi	Diamond Pro 91txm	1429
NEC	Multisync M700	740
Radius	Pressview 21SR	3069
Sony	Multiscan 200SF	709
Sony	Multiscan 200SX	619
Viewsonic	Optiquest V773	509



Epson Stylus Color 800 $369.00

Printers

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Apple	Stylewriter 4500	339
Apple	LaserWriter 4/600	689
Apple	LaserWriter 12/640	1489
Alps	MD1000 Micro Dry Mac/PC	389
Epson	Stylus Color 600 1440dpi	279
Epson	Stylus Color 800 1440dpi	369
GCC	Elite XL 608 600 DPI	2259
GCC	Elite XL 808 800 DPI	2839
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Iomega	Jaz 1GB Generic & Cart. Ext.	359
Iomega	Jaz 1GB Retail & Cart. Ext.	389
Iomega	Jaz 1GB Retail & 4 Cart. Ext.	599
Syquest	EZ 230 MB & Cartridge	169
Syquest	Syjet 1.5GB & Cartridge Int.	379
Syquest	Syjet 1.5GB & Cartridge Ext.	429
Syquest	Syjet 1.5GB & Cart. House Ext.	379
Fujitsu	640 MB Dynamo Int.	479
Fujitsu	640 MB Dyna. House Ext.	475
Fujitsu	640 MB Dynamo Ext.	599
Olympus	230 MB PowerMo Ext.	349
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Pinn. Micro	4.6 GB Apex Ext.	1250
VST	230MB Opt. Dr. PB 3400	439
VST	230MB Opt. Dr. PB 1400	435

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La Cie SilverScan Pro Office $389.00

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Epson	Express. 636 Artist	900
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Umax	Astra 600S 300 dpi	224
Umax	Astra 1200S 600 dpi	435
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512K	L2 Dimm, 7200-9500 Series	120

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Fujitsu Allegro 4.4 GB N	599	659
Quantum Atlas II 4.5 GB N	759	819
Quantum Atlas II 4.5 GB W	759	859
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4400 200MHz/32MB/2GB/8XCD/Level-2(Office Version)	$1,599.00
7300 200MHz/16MB/2GB/12XCD	$1,999.00
7300PC 200MHz/16MB/2.0GB/8xCD	$2,799.00
8600 300MHz/64MB/4GB/Zip Drive/24XCD	$3,299.00
9600 350MHz/64MB/4GB/24XCD/Zip	$4,899.00
9600MP 200MHz/32MB/4GB/12xCD/4MBVR	$3,399.00

Buy a PowerMac and Add the Office Solution!

Microsoft Office 4.2.1 + 16MB Memory



For Only **$299**

Power Mac 6500 series

6500 225MHz/32MB/3GB/12XCD/33.6Mdm	$1,499.00
6500 250MHz/32MB/4GB/12XCD/33.6Mdm/Zip drive	$1,759.00
6500 250MHz/48MB/4GB/12XCD/33.6Mdm/Zip(Office)	$2,099.00
6500 275MHz/32MB/4GB/12XCD/33.6Modem/Avid cinema/...	$2,499.00
6500 300MHz/64MB/4GB/12XCD/33.6Mdm/Zip drive	$2,499.00

PowerBooks

1400cs • 133MHz16MB/1.3GB/8XCD/128 k L2	$2,099
1400c • 166MHz16MB/2GB/8XCD/128 k L2	$2,899
3400c • 200MHz16MB/2GB/12XCD/33.6 modem	$3,799
3400c • 240MHz16MB/3GB/12XCD/33.6 modem	$4,599

Apple Servers

1-AppleShare IP 5.0:advanced server soft. that enables you to incorporate a server into a Intranet easily to take full advantage of Internet technology & more

	Applic. Solution	¥ Internet Solution	1-Apple Share Solution
7250 120MHz/16MB/2GB/8XCD	$1,399.00	$1,699.00	
7350 180MHz/48MB/4GB/12XCD	$2,599.00	$2,999.00	$3,499.00
9650 233MHz/64MB/8GB/12XCD	$4,299.00	$4,899.00	$5,699.00

¥Internet Solution Includes:Claris Home Page,Open Door LogDoor,Apple MacDNS, NetCloak,Netscape,BBEdit, WebSTAR/SSL,GO liveCyberStudio,Butler SQL & more

UMAX

C500LT 180/16/1GB/8XCD	$899
C500LT 200/16/1GB/8XCD	$990
C500C 180/16/1GB/8XCD	$1073
C500I 180/16/1.2GB/8XCD	$1073
C500I 200/16/2GB/12XCD	$1083
C500E 200/16/2GD/8XCD	$1083
C600 180/16/1GB/8XCD/33.6	$1049
C600L 180/16/1.2GB/8XCD	$1073
C600L 200/16/2.1GB/8XCD	$1183
C600L 240/24/2.1GB/8XCD	$1488
C600L 200/32/2.1GB/12XCD	$1664
C600L 240/32/2.1GB/12XCD	$1787
C600L 280/32/4GB/12XCD	$2184
C600X 240/32/3GB/12X/33.6	$1869
C600X 280/32/4GB/12X/33.6	$2189
J700 180/24/2.1GB/CD/33.6	$1739
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Free Astra 600scanner/ any **C600**
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Apple Message Pad 2000

- *160Mhz RISC proc.*
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$899.

†Modem not included

Memory

Super Hot Deal

32MB RAM SIMMS $105 32MB

SIMMS		DIMMS	
4MB	$16	8MB	$32
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16MB	$48	32MB	$115
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		128MB	$699

Monitors



Apple 15AV **$399.**

Apple

Multiscan 1705	$629.00
Multiscan 1710	$779.00
Multiscan 850 20"	$1,499.00
Multiscan 850AV 20"	$1,659.00



Viewsonic 17EA 17"AV **$513.**

Viewsonic

E641 14"	$209.00
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17EA 17"	$513.00
15GS 15"(Graphic Series)	**$339.00**
15GA 15" (Graphic Series)	$369.00
17GS 17"(Graphic Series)	$569.00
17GA 17" (Graphic Series)	$619.00
GT770 17"(Graphic Series)	$629.00
GT775 17"(Graphic Series)	$659.00
G800 20" (Graphic series)	$1,029.00
GT800 20" (Graphic Series)	$1,199.00
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17PS 17"(Pro Series)	$699.00
PT770 17"(Pro Series)	$699.00
P810 21"(Pro Series)	$1,399.00
P815 21"(Pro Series)	$1,559.00
VP140 15"(Pro Series)	$2,199.00
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3 Year Warranty



Sony 17" 200SX **$599.**

Sony

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100SF 15"	$369.00
200SX 17"	**$599.00**
200SF 17"	**$669.00**
300SF 20"	$1,299.00
SE2 20"	$1,699.00

Printers

Stylewriter 1500



$139.

Apple

Color Stylewriter 2500	$199.00
Laserwriter 4/600	$679.00
Laserwriter 12/640	$1,299.00

Epson

Stylus Photo (New)	$459.00
Stylus Color 600	$289.00
Stylus Color 800	$409.00
Stylus Color 1520	$759.00
Stylus Color PRO XL	$1,369.00
Stylus 3000	$1,699.00

HP

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Epson Stylus 800



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Better Images Through Innovation.

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35T 35MM Slide	$659.00
ScanMaker E6	$279.00
ScanMaker III	$1,199.00

Model not shown !

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$145

- 24-bit color depth
- Single-pass speed
- 300x600 dpi optical resolution

Agfa

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StudioStar	$699.00
Arcus II (PhotoLook)	$1,299.00

Umax

Astra 600	$199.00
Astra 1200 (soho)	$349.00
Astra Transp. Adapter	$179.00
Power Look II(Photo. full)	$1,299.00
√Power Look 2000	$1,999.00

√ - after manufacturer's rebate

Modems

Supra 33.6



$89

Global Village

Teleport 56Kbps	$169.00
Teleport Platinum 33.6	$165.00

Supra

SupraSonic 33.6	$179.00
Supra Express 56e w/ speaker.	$179.00
Supra Fax Modem 28.8 33.6	$149.00

U.S.Robotics

Sportster 33.6 Fax/Modem	$109.00
¥Sportster 56k (2X tech.)	$139.00

Sportster Voice 33.6



$69 ¥

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•Video capture in real time,edit ,add effects and save back to tape w/ no loss!

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Microsoft Office 4.2.1
Full version

$299.

Microsoft
Microsoft Office 4.2.1 (full version)....$299.
Office 4.2.1 (upgrade)....$199.
Microsoft Word 6.0.1 (full version)....$269.
Microsoft Excel 5.0 (full version)....$269.
Microsoft Excel 5.0 (upgrade)....$119.

Now Software
Now Contact and Up-to-Date 3.6.5....$79.

PowerSoft
PowerBuilder 5.0(database tool to handle SQL in most environments *MAC,UNIX, Windows NT*....$2,699.

Timeslips
Timeslips 4.0....$279.

Design / Graphics

Adobe Photoshop 4.0
Upgrade

$139.


Adobe Photoshop 4.0

Adobe Systems
PageMaker 6.5 (full version)....$399.
PageMaker 6.5 (upgrade)....$89.
Photoshop 4.0 (full version)....$399.
Photoshop 4.0 (upgrade)....$139.
Illustrator 7.0 (full version)....$349.
Illustrator 7.0 (upgrade)....$89.
FrameMaker 5 (full version)....$489.
Streamline 4.0 (full version)....$129.

Artifice
Design Workshop 1.5....$569.

Astound
Astound 3.0....$126.

Deneba
Canvas 5.0 (design & illustration)....$379.

Engineered Software
Power CADD 3.0 (pro-level draft-prog.)....$649.

Fractal Design
Detailer (Paints 3D models)....$294.
Expression 1.0 (object-oriented drawing)....$294.
Painter 5.0 (full version)....$269.
Painter 5.0 (upgrade)....$89.
Poser2.0 (human-models in 3D envir.)....$134.

Graphsoft
MiniCad 6.0....$539.
BluePrint 5....$199.

Painter 5.0



The World's Most Creative Design Tool!

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Radical New Features for Unlimited Creative Freedom!

ImageXpress
ScanPrepPro 3.1 (automates image-process)....$639.

IMSI
Turbo CAD 2D/3D 3.0 (semi-pro CAD soft)....$129.

Macromedia
Director 6 multimedia studio (full version)....$899.
Director 6 multimedia studio (upgrade)....$459.
Director 6 (full version)....$749.
Director 6 (upgrade)....$369.
Extreme 3D 2.0 (3D-design,print,animation)....$349.

FreeHand 7 - graphics studio

Upgrade

$169.

Full Version $299



Free Hand V7.0 (full version)....$199.
Free Hand V7.0 (upgrade)....$135.
SoundEdit 16 2 (full version)....$269.
Macromedia Flash (full version)....$189.
Fontographer(full version)....$299.

Quark Xpress



The Best price on the Market!

Only

$619.

Quark
QuarkXpress 3.3.2 (publishing)....$619.

Specular
Infini-D 4(3D/Animation/modeler)....$399.
Infini-D 4competitive upgrade)....$229.
Infini-D 4(upgrade)....$89.
Collage 2.0 CD....$79.

Others
Eye Candy 3.0 (Photoshop filters)....$189.
Object Dancer 1.1 (Object-oriented animat.)....$419.
Phototools 1.1(Photoshop filters)....$94.
Texture Creator 2.0 (Pro Level 3D graphics)....$125.
Walkthrough 2.6 (Architectural design)....$449.

Internet / Database

•Instant Database publishing on the Web/
•Desktop publishing with Database content/
•Launch Java applets and much more...

Upgrade

$95.

FileMaker 4.0



Claris
FileMaker Pro 4.0 (Full)....$189.
Claris Home Page....$94.
Claris Works Office....$94.
Claris E-Mailer 2.0 (e-mail manager)....$39.

Farallon Communications
Timbuktu Pro 3.0....$125.

Net Objects
Net Objects fusion 2.0(Website builder)....$449.

RUN
RunShare 2.1(AppleTalk network 2-users)....$289.

StarNine tech.
Quarter Deck Mail 4.0 (Mail server)....$299.
Quarter Deck Mail 4.0 (5-user pack)....$199.

Symantec
Symantec Visual café....$194.
Symantec Visual Page....$94.


Adobe Illustrator 7.0

Adobe Illustrator 7
Upgrade from V.5.0 or later

• A Solid
•reliable
• complete
• graphics
•Application

Now

$89.

Utilities/Programming

Apple Computer
MAC OS 8 (Macintosh operat. system)....$95.
Share IP 5.0 (Network manager)....$699.

Caere
Omni Page Pro 7 (OCR soft. pack)....$439.

Casady & Greene
Conflict catcher 4.0.2 (Start-Up tool)....$69.

Connectix
Speed doubler 2.0.1. (file transfer utility)....$89.
RAM doubler 2.0.1. (Doubles your RAM)....$89.

Datawatch
Virex 5.7 (great features in virus-detection)....$67.

Metrowerks
Code Warrior 10 gold(programming)....$339.

mFactory
mTropolis 1.1 (authoring tool)....$1099.

Now soft.
Now utilities 6.7....$85.

Starnine tech
ListStar 1.1 (mailing-list management)....$429.

Symantec
SAM 4.5 (virus protection)....$49.*

Effects/Plug-ins/Media

Adobe After Effects 3.1



•Broadcast multimedia and Film production Tool!

Now

$399.

Adobe
Premiere 4.2 (full version)....$399.
Persuasion 4.0 (full version)....$299.

Allegiant Tech
SuperCard 3.0 (authoring tool w/ web plug-in)....$299.

Artel Software
Boris Effects 2.1 MP (Adobe plug-in)....$499.

DigiEffects
Aurorix 2.0 (full version)....$249.
Berserk 1.3 (full version)....$249.
Cyclonist 1.0 (particle-generation soft.)....$429.

Extensis
QX-Tools 2.0 (Xtensions-collection)....$94.

Knoll soft.
Lens Flare Pack 1.5 (after effects plug-in)....$139.

MetaTools
Bryce 2....$168.
Final Effects AP 1.0 (particle-generation)....$189.
KPT Final Effects 3.0.1 (effects collection)....$659.
Studio Effects 1.0 (3D particle-generator)....$659.

M.M.M. Soft.
HoloDozo 1.0 (Adobe Premiere plug-in)....$129.

NewTek
LightWave 3D 5.0 (Pro-Level animation)....$1299.

The Valis Group
Movie Flow 2.0.2. (image distortion soft.)....$639.

XaosTools
TypeCaster 2.0 (3D text-plug-in)....$169.



Most widely used desktop web server software on the Internet !

$399

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Others/Various

Delta Graph 4.0....$135.
GoLive Cyber Studio(Web Site des./build)....$289.
Letter Rip 1.0.2 (Superb mail-list server)....$269.
Live Picture XT....$138.
Prism 2.0 (Ideal statistics package)....$459.
QuickKeys 3.5.2 (Powerful Macro Utility)....$115.
Roaster Release 3 (Java Tools)....$95.
SoftWindows 95 v.4.0....$299.
Ultimatte for Mac 2.0 (Keing plug-in)....$1399.
Wingz 2.1.1 (Powerful progr. tool)....$369.

STORAGE - MEDIA & HARD DRIVES

JAZ DRIVE



$389

Jaz Drive w/ 1 cartridge....$389
MacNet Jaz Dr. w/ 3 car....$499
Internal Jaz Drive....$219
1GB Jaz Cartridge....$82

JAZ & CD-RECORDER DUO
Jaz Drive & LaCie 2X/6X CD-R....$799

SYJET & CD-RECORDER DUO
SyJet 1.5G & LaCie 2X/6X CD-R....$799

ZIP DRIVE



$139

Zip drive w/ 1 cartridge....$139
Zip drive w/ 11 cart....$269
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2X REC/6X Play Recordable CD-Drive

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Catch the CD-R Wave!

•For large file transfers, or mass distribution of media,(sound&image) CD-R provides the least expensive solution!
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SyJet 1.5GB drive....$369
SyJet 1.5GB cartridge....$95
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4X/6X CD-R w/Toast software....$729
LaCie 8X CD-ROM....$179
LaCie12X CD-ROM....$199

Capacity	Model	Access	RPM	Interface	Drive cache	Int.	Ext.
2.1 GB							
Quantum	TM2110S	11 Ms	4500	Ultra SCSI-3	128k	$239	$289
Seagate	32151N	9 Ms	5400	Ultra SCSI-3	256k	$299	$349
Quantum	ST2160S	10 Ms	5400	Ultra SCSI-3	128k	$249	$299
Quantum	Atlas 32275	8 Ms	7200	Ultra Wide SCSI-3	512k	$299	$349
IBM	32160W	8.5 Ms	5400	Ultra Wide SCSI-3	512k	$299	$349
3.2 GB							
Quantum	M3240S	10 Ms	5400	Ultra SCSI-3	128k	$319	$369
4.3 GB							
Conner	CFP4207W	10 Ms	7200	Fast Wide SCSI-2	512k	$560	$610
Fujitsu	M2934SAU	8 Ms	7300	Fast SCSI-2	512k	$559	$599
Fujitsu	M2954SYU	8 Ms	7300	Ultra SCSI-3	512k	$599	$649
IBM	DCAS-34330	8.5 Ms	5400	Ultra SCSI-3	512k	$419	$469
IBM	DCAS-34330W	8.5 Ms	5400	Ultra Wide SCSI-3	512k	$459	$509
Quantum	CY54335A	14 Ms	3600	EIDE-4	128k	$259	$319
4.5 GB							
Seagate	ST34501W	8.5 Ms	10033	Ultra Wide SCSI-3	512k	$799	$849
Micropolis	MC4345WS	7.9 Ms	7200	Ultra Wide SCSI-3	512k	$599	$649
Seagate	ST34572W	8.9 Ms	7200	Ultra Wide SCSI-3	512k	$699	$749
Quantum	AL34550S	8 Ms	7200	Ultra SCSI-3	512k	$659	$709
Quantum	AL34550SW	8 Ms	7200	Ultra Wide SCSI-3	512k	$669	$729
6.5 GB							
Quantum	QTST6480s	10 Ms	5400	Ultra SCSI-3	128k	$669	$719
9.1 GB							
Micropolis	3391NS	7.9 Ms	7200	Ultra SCSI-3	512k	$949	$999
Quantum	AL39100SW	8 Ms	7200	Ultra Wide SCSI-3	1024k	$979	$1029
Seagate	19171N	9 Ms	7200	Ultra SCSI-3	512k	$990	$1050

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With 15" Monitor

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Ikegami 21" Diamondtron NEW! 2 YEAR WAR	$1599
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Radius PrecisionView 21	$1599
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SuperMac 21" Color Display	$1199

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17" SuperMac Multi-Scan	from **$499**
E-machines T16 II (16" viewable)	$529
Radius PrecisionView 17	$599
Radius PrecisionColor Display 17 (1280x1024)	$699
Radius PressView 17sr NEW!	$1799
Portrait Display Labs 1700 NEW!	$859



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Radius 15" Pivot	$199

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Atto Silicon Express 4 SCSI Accelerator	$199
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Radius Thunder 3D	$2199
Radius ThunderTX 1152	$1099
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1600x1200 (21" or greater resolution) Thunder IIGX and Thunder IVGX series	from $599
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Se/30, LC, or PDS bus?? Call Us!!	

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Apple 150 MHz 604 card	$199
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Apple Computer



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PowerMac 8500 16mb/2gb/cd	$1599*
PowerMac 7300/180 16mb/2gb/cd	$1799*
PowerMac 8600/300 32mb/2.0gb/cd	$3349*
PowerMac 9600/350 64mb/4.0gb/cd	$5079*

Umax Computer Corporation

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SuperMac J700/180	$1649*
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Motorola Computer Group

StarMax 3000/160	$999*
StarMax 4000/200	$1499*
StarMax 5000/225	$1899*

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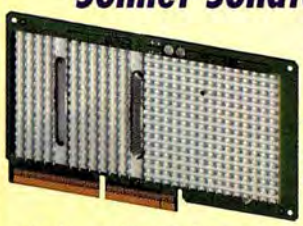
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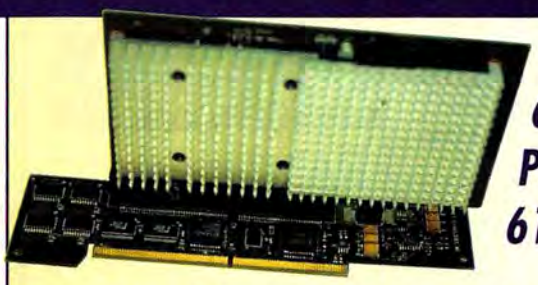
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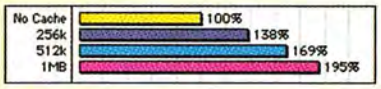


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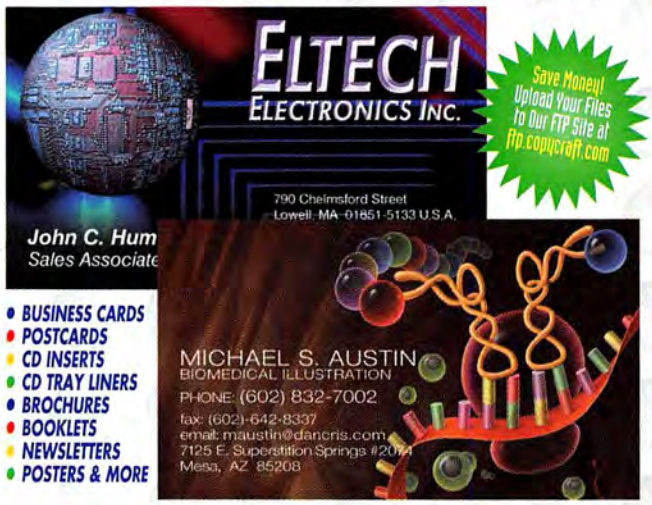
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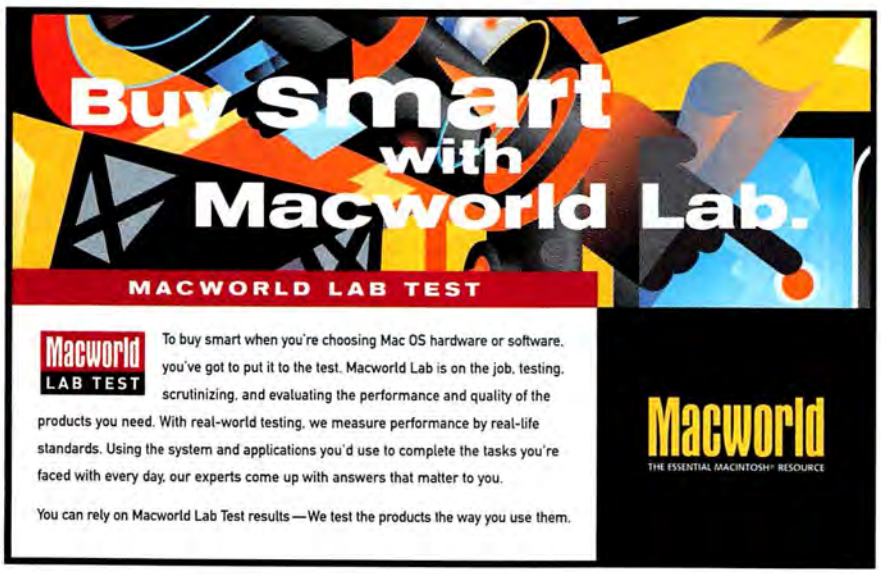
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interval; it's your Mouse control panel's double-click speed setting, of all things.)

Clarity of Language

In a hundred little ways, OS 8 represents a leap forward in the Mac's communication skills. Now the Finder shows file dates as "Today" and "Yesterday," which is way more helpful than "Tuesday, October 14, 1997" or whatever. And, in this day of multigig hard drives and 64-meg RAM chips, it makes sense that OS 8 reports RAM and hard-disk space in megabytes (MB), using kilobytes (K) only when reporting on small files.

Apple did lots of work on dialog boxes' wording, too. If you tried to turn on file sharing without a password, you used to be told, "This is not advised." Mac OS 8 explains *why:* "This is a security risk." The force-quit message (produced when you press ⌘-option-escape) is a model of helpful clarity now, too, replacing System 7's taciturn grunt ("Force quit?"). You'll see similar conversational smarts when you try to trash something that's already being copied, or trash something while the Trash is being emptied.

On-Screen Niceties

PowerBook users have long endured frustrating screen controls. You push and push, but the brightness and contrast changes are so subtle, you're not even sure you're accomplishing anything. But in Mac OS 8, an on-screen gauge pops up the instant you start pushing those controls.

Deletion Protection

Of all the Mac OS 8 improvements, my favorite is ⌘-delete. I sit here all day, drool running down my chin, just clicking on icons and flinging them into the Trash without the mouse. And look how elegantly Apple has done it: First, a little animation shows the icon flying into your Trash can. Second, the keystroke works only if the highlighted icon is in the frontmost window. Isn't that smart? Apple realizes that otherwise, you might fling something from an overlapped window into the Trash accidentally, without even knowing it was highlighted. Safety first!

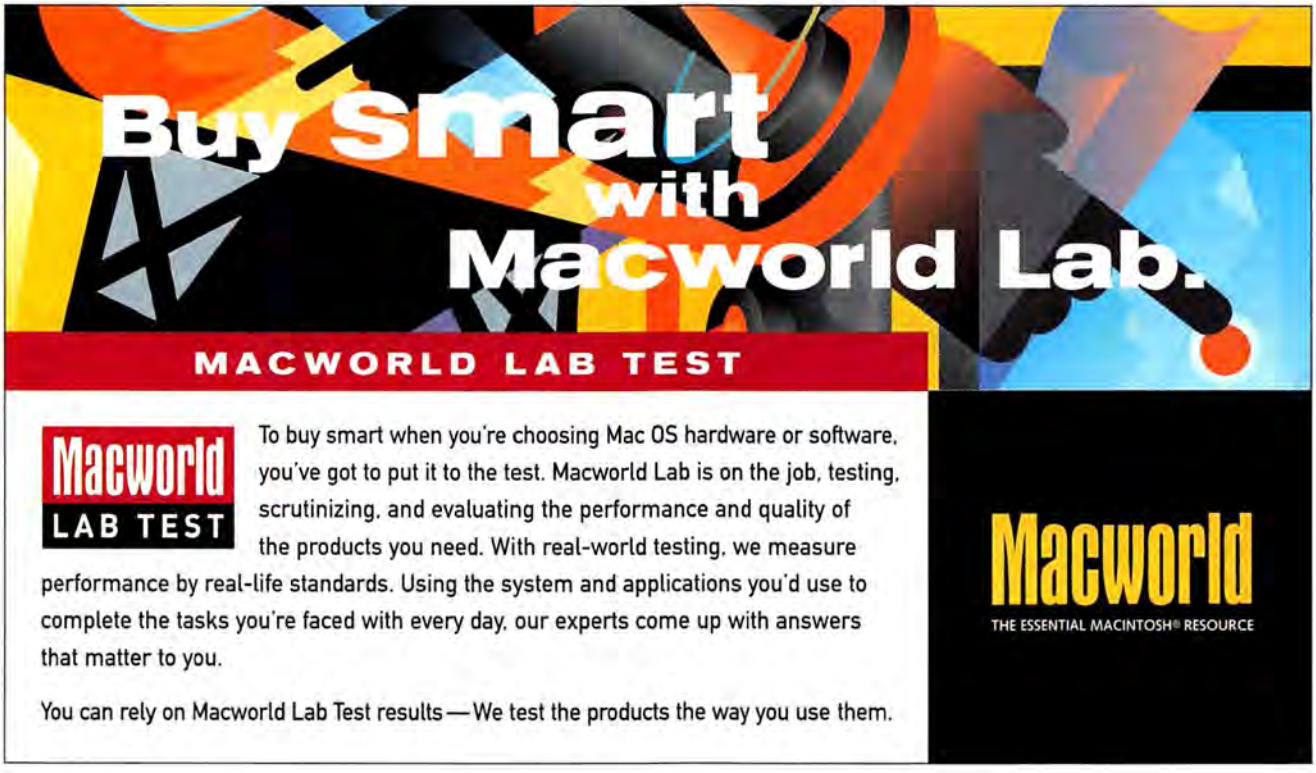
The Upshot

Rats, I can see the bottom edge of this column looming. I won't be able to coo about the new Charcoal system font, which I adore; the shrewdness of renaming the question-mark menu Help (so novices will finally stop associating the question mark with the clock); the arrow pointer's changing shape (when you're option-dragging something, for example); or the way the sharp tips of the Color Picker crayons actually *wear down* over the years.

The blood, sweat, and tears evident in Mac OS 8's design confirm what I've always suspected: that the gang at Apple Computer does its best work when its collective back is against the wall. All of this detail work and attention to the *feel* of using a Macintosh confirms something else, too: No matter what your friends (or enemies) say, Windows 95 offers nowhere near the Mac's ease of use, clarity, friendliness, or power. Update your bumper stickers, kids: "Mac OS 8 = Windows 2010." **m**

DAVID POGUE (www.pogueman.com) is the author of *Macs for Dummies*, fifth edition, newly updated for Mac OS 8 (IDG Books Worldwide, 1997). Thanks to Apple's Ly-Huang Pham for assistance with this article.

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by David Pogue

OS 8 and Why It's Great

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I'LL SAY IT, AND I'M PROUD: I'm nuts about Mac OS 8. It gives the Mac a modern look without being avant-garde, fixes annoyances that have bugged me since 1984, and adds new power-user features without gumming up the interface for novices.

Now, most articles about OS 8 dwell on the new features. You probably know about them (see "Mac OS 8 Arrives," September 1997): the full-screen desktop pictures, spring-loaded folders, pop-up windows, yadda yadda yadda. But it's not the new features that make me all warm and gushy inside; it's the tiny touches nobody else seems to notice. The polish. The detail work. The fit and finish.

I used to think that the *Mona Lisa* was a painting of some dame grinning. But a college art-history class taught me about the geometric shapes that underlie the painting's layout, how the color choices set a mood, and so on. In the same way, I'd like to put Mac OS 8 up on the big college slide projector and take the world on an art-appreciation tour of *its* finer points. My talk would go something like this:

The Telltale CD Pattern

To install new system software, you're supposed to start up from the master CD. But before the days of OS 8, you'd sit there for five minutes of start-up, anxiously wondering whether you were actually booting from the CD and not the hard drive.

But in Mac OS 8, the CD fills your desktop picture with a massive invasion of flying CDs, so you know instantly which disk is in charge. Simple, clever, and friendly.

Elegance around the Edges

The new OS's three-dimensional *icons* are only the tip of the 3-D iceberg. Examine the menu bar: The tippy-top edge of it is solid white, and the very bottom edge is solid black. Yes, that's right, you can actually identify which way the *light* is shining on your gently bulging menu bar!

But what I love most about the new look is the rounded corners of the screen. They've been smoothed, antialiased, and faintly shadowed, making them even more graceful than before. (Windows 95 screen corners are square.)

⌘-E with No Ghost

For 13 years, books like *Macs for Dummies* have had to warn new Mac fans not to use the Eject Disk command to eject a disk! Doing so would leave a ghosted disk image on the screen; in a matter of moments, the computer would crankily demand that you put the disk back in.



No more. Apple finally realized that the days of copying files between floppies (the original idea behind the floppy-icon ghosting deal) are long gone. Now Eject Disk (or ⌘-E) does exactly what it says—no ghosts, no crankiness.

Brainy Desktop Resizing

If you try to change the screen resolution in Windows 95, you're told, "This will take a few seconds. If Windows does not reappear correctly, wait 15 seconds, and your original settings will be restored." Whatever you say, Bill.

The Macintosh changes resolutions with no such griping. But in Mac OS 8, it even resizes all your Finder windows so that they don't get chopped off at the edge of the screen. Mac OS 8 even rearranges your desktop furniture, putting your icons roughly where you left them. Now your Trash can is always in the lower-right corner of the screen, even if that corner (thanks to your changing the monitor zoom level) is in a very different place than it was before.

High-IQ Sticky Menus

Mac OS 8's menus now stay down when clicked, "just like in Windows." Actually, though, our sticky menus are quite a bit brainier. For example, a pulled-down OS 8 menu snaps back up, all by itself, if you don't make a selection within 15 seconds; if you've pulled down a menu and then wandered away to answer the doorbell, the Macintosh will continue whatever it had been doing in the background (printing, for example).

The brilliant part of Apple's new operating-system design is that it doesn't disturb Mac fans who don't like change. For those who keep their finger on the mouse continuously, menus still work the way they always have. In fact, here's a twist I'll bet you haven't noticed: If you click on a menu title for longer than about a second, the menu snaps back up when you release the mouse, just as it always used to—a nod to those of us who sometimes want to read a menu without actually choosing anything from it. (What's more, you can actually *change* that "about a second"

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CHRIS CHING


Christian Murphy was non-verbal. He lived with a wall between himself and the world.



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